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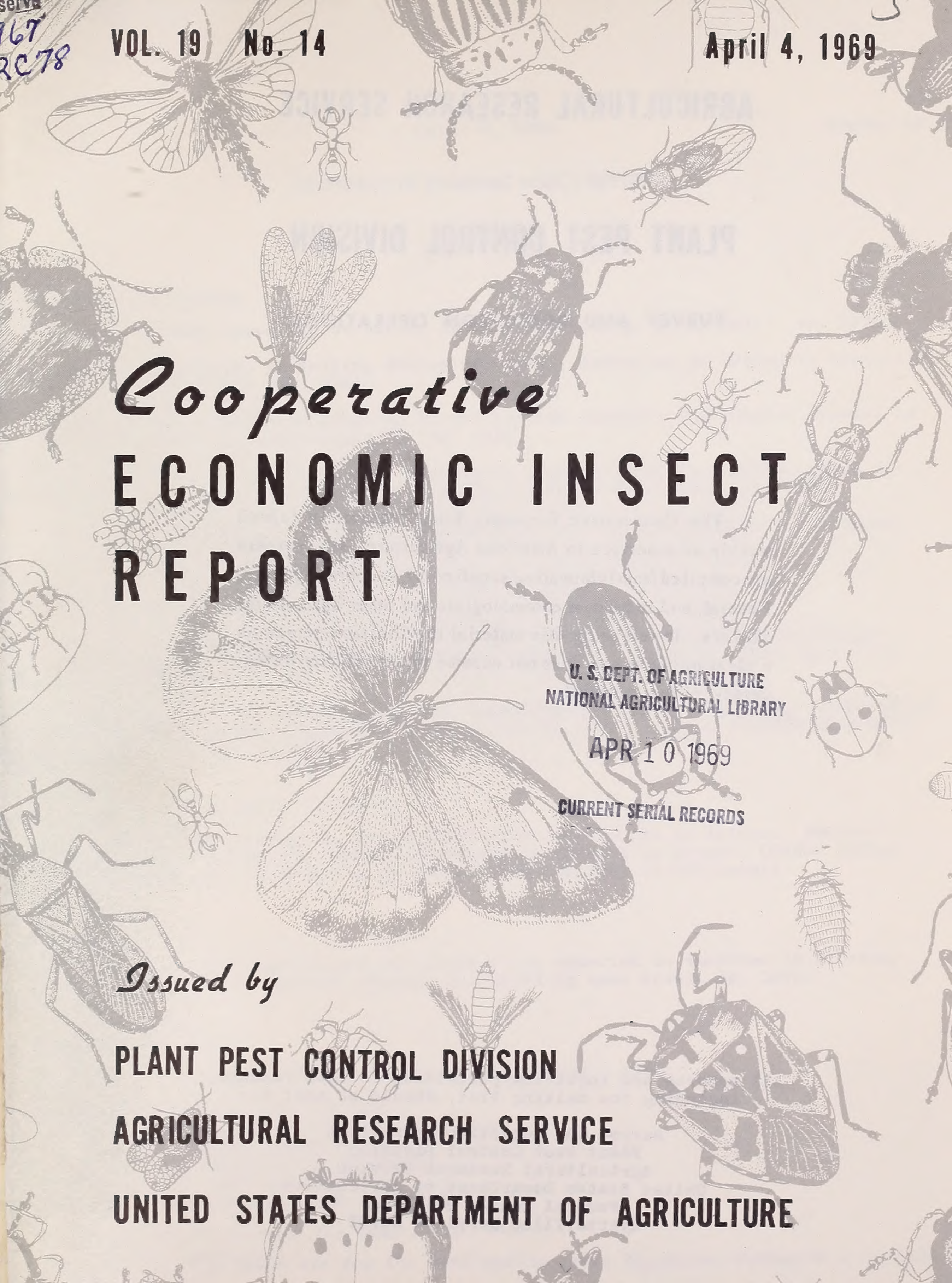

VOL. 19 No. 14 April 4, 1969

Cooperative
ECONOMIC INSECT REPORT

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PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Plant Pest Control Division
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Federal Center Building
Hyattsville, Maryland 20782

Volume 19 April 4, 1969 Number 14

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

CORN LEAF APHID appearing on barley in Imperial County, California. (p. 235).

GREENBUG increasing in Rolling Plains of Texas. Appearing on barley in Imperial County, California. (p. 235).

EUROPEAN CORN BORER overwintering larval surveys indicate high winter survial in Maryland, Illinois, and Colorado. (p. 235).

NANTUCKET PINE TIP MOTH surveys in northern Alabama indicate numerous pupae in pines. Damaged 2-year-old pines in Haywood County, Tennessee. (p. 238).

COMMON CATTLE GRUB adults active and annoying cattle in Payne County, Oklahoma. (p. 239).

Detection

● A SPHECID WASP reported for first time in Hawaii. This is a new Western Hemisphere record but the species is not known to occur in the continental United States. (p. 241).

Other State records include TEPHRITID FLIES from Wisconsin and Oregon, a WHITEFLY in Texas, and LESSER MEALWORM from Wisconsin (p. 242); and an EPIDERMOPTID MITE from Connecticut (p. 253).

Some First Occurrences of Season

A LEAFHOPPER in Washington, GREAT BASIN TENT CATERPILLAR in Arizona, SPRING CANKERWORM in Minnesota, WESTERN SUBTERRANEAN TERMITE in Oregon, COMMON CATTLE GRUB in Oklahoma, HORN FLY in Oklahoma, PINK BOLLWORM in California.

Forecast

CITRUS RUST MITE infestations on mature fruit expected to increase in Florida. APHIDS expected to increase through mid-April in same area. (p. 237).

Special Reports

Summary of Insect Conditions in the United States - 1968.

Man and Animals (pp. 243-252).
Households and Structures (pp. 252-254).
Stored Products (pp. 254-255).
Beneficial Insects (pp. 255-258).
Weather of Year (pp. 259-261).
List of Contributors (pp. 261-262).

Distribution of Face Fly (map). (p. 245).

Reports in this issue are for the week ending March 28 unless otherwise indicated.

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Summary of Insect Conditions in the United States - 1968

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WEATHER BUREAU'S 30-DAY OUTLOOK

APRIL 1969

The Weather Bureau's 30-day outlook for April is for temperatures to average above seasonal normals over the western third of the Nation. Below normal temperatues are expected over most of the eastern half of the country, with greatest departures over the northern Mississippi Valley. Near normal temperatures are in prospect over the mid-Atlantic States and in a narrow band over the western Plains. Precipitation is expected to exceed normal over most of the South, the Tennessee Valley, and the Ohio Valley. Subnormal precipitation is indicated over the Great Basin and Southwest, as well as the northern Plains and northern Mississippi Valley. Near normal totals are in prospect along the Pacific northwest coast and the eastern slopes of the northern Rockies, from the southern Plains to the Great Lakes, and along the Atlantic Coast.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

WEATHER OF THE WEEK ENDING MARCH 31

HIGHLIGHTS: Pleasant sunny weather continued over the West with a rising temperature trend. In the East, the skies were cloudy, the weather was disagreeably cold, wet, and windy.

PRECIPITATION: Clear, sunny weather prevailed over the West during the week. Light rains fell along the northern Pacific coast as far south as Eureka, California, over the weekend. A storm centered over the Missouri Ozarks early Monday morning moved northeastward arriving at northern Maine by Wednesday. Heavy snow fell in the central and southern Rocky Mountains. An inch or two of snow fell from the northern Great Plains to the Great Lakes with locally heavy rain from the Ozark Mountains across the Ohio River Valley to Maryland and south-

Weather of the week continued on page 242.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (Chorizagrotis auxiliaris) - NEBRASKA - Averaged less than 1 per linear foot in 40 grain fields in Hayes, Hitchcock, Chase, Dundy, and Red Willow Counties. Light, averaged about 0.5 larva per alfalfa crown, in about 25 fields in Hayes, Hitchcock, Chase, Dundy, and Red Willow Counties. (Andersen). Three of 16 alfalfa fields in Dawson County had 1-8 per 10 square feet. (Manglitz). COLORADO - Larvae on wheat in Weld and Morgan Counties. Up to 1 per linear foot of drill row in Milliken area, 0-2 in Hudson and Prospect Valley areas. Feeding light to date. (Johnson). OKLAHOMA - Ranged 2-5 per 10 linear feet in wheat and alfalfa in Greer County. Light to moderate in alfalfa in Beckham County. (Okla. Coop. Sur.).

BEET LEAFHOPPER (Circulifer tenellus) - UTAH - Active on Cheirinia repanda and Erodium cicutarium west of Snowville, Box Elder County. (Knowlton, Mar. 22).

CORN LEAF APHID (Rhopalosiphum maidis) - CALIFORNIA - Appearing on barley in El Centro and Holtville, Imperial County. (Cal. Coop. Rpt.). TEXAS - Light on barley in Brewster County. (Neeb).

GREENBUG (Schizaphis graminum) - MISSISSIPPI - Light, about 20-30 per 100 sweeps, in 30-acres of winter wheat in Attala County. (Dinkins, Mar. 21). ARKANSAS - Survey negative in northwest area. (Boyer). TEXAS - Survey made in 15 panhandle counties and number per row foot as follows: Carson 500; Gray 500; Roberts 50; Ochiltree 10; Lipscomb 10; Hemphill 100; Hutchinson 20; Hansford 20; Armstrong 1,200; Donley 3,500; Childress 300; Collingsworth 300; Wheeler 200; Hale 400; and Floyd 3,000. (Daniels, Mar. 20-26). Increased activity observed in Baylor, Childress, Foard, Knox, Motley, and Wilbarger Counties; populations heavy in each county. Light to moderate damage in Wichita County. Still problem in counties near Lubbock. Spraying in several areas of Rolling Plains. (Boring). OKLAHOMA - Counts per linear foot as follows: Tillman and Cotton Counties, 100-200 in some fields; Jackson and Harmon Counties, 20-100; Greer and Blaine Counties, moderate; Custer and Washita Counties, 10-20; Cleveland County, light. (Okla. Coop. Sur.). NEBRASKA - None observed in 40 fields in Hayes, Hitchcock, Chase, Dundy, and Red Willow Counties. (Andersen). NEW MEXICO - Light to 100+ per linear foot in barley at Roswell, Chaves County. (Mathews). Very light in small grains near Lovington, Lea County. (Nielsen). ARIZONA - Very light on barley, oats, and wheat in Yuma, Yuma County. (Ariz. Coop. Sur.). CALIFORNIA - Appearing on barley in El Centro and Holtville, Imperial County. (Cal. Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARKANSAS - Survey negative in northwest area. (Boyer). NEW MEXICO - Up to 40 per 50 sweeps in alfalfa in Mesilla Valley, Dona Ana County. (Elson).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (Ostrinia nubilalis) - MARYLAND - Overwintering populations heavy in Wicomico and Dorchester Counties. Ranged 1-8 per plant in stubble. (U. Md., Ent. Dept.). ILLINOIS - Survey in 9 counties indicates winter survival of 77 percent. (Ill. Ins. Rpt.). COLORADO - Live larvae in cornstalks checked in Prospect Valley area, Weld County. (Johnson).

SMALL GRAINS

PALE WESTERN CUTWORM (Agrotis orthogonia) - NEBRASKA - Hatching in Dundy and Chase Counties. Trace damage appearing. (Andersen).

A LEAFHOPPER (Keonolla confluens) - WASHINGTON - First observed in flight at Yakima, Yakima County, March 15. (Landis).

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARKANSAS - Ranged 40-50 per 100 sweeps in wheat and oats in northwest areas; no increase. (Boyer).

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Heavy in small grains in Foard County. (Boring).

BROWN WHEAT MITE (Petrobia latens) - NEW MEXICO - Infested 2 of 8 small-grain fields checked at Lovington, Lea County; damage minor to foliage. (Nielsen).

TURF, PASTURES, RANGELAND

CHINCH BUG (Blissus leucopterus) - KANSAS - Bunch grass samples for spring survey collected late February from a total of 55 counties in central and eastern districts. Total of 173 samples collected. Average number per square foot by district as follows: Northeast 0, east-central 11, southeast 63, north-central 29, central 77, and south-central 62. (Wilde, Martinez, Redding, Simpson). This replaces note in CEIR 19(13):212. (PPC).

LYGUS BUGS (Lygus spp.) - WASHINGTON - Larger numbers moving from hibernation at Yakima, Yakima County. (Landis, Mar. 21). UTAH - L. elisus active on rangeland at Snowville, Box Elder County March 21. (Knowlton).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - INDIANA - Larval samples on new growth alfalfa in southeastern area negative. (Huber, Mar. 22). ILLINOIS - First and second instars averaged 33 per square foot in 3 to 4-inch alfalfa in southeastern section. (Ill. Ins. Rpt.). TENNESSEE - Hatch began week of March 21 in Blount and Knox Counties. (Mullett). MISSISSIPPI - Averaged 20 larvae per square foot in 3 acres of Oktibbeha County alfalfa. (Dinkins, Mar. 21). Larvae per 200 stems by county: Pontotoc 39, Oktibbeha 19, Marshall 16. Adults per 10 square feet by county: Pontotoc 3, Oktibbeha 3, Marshall 2. (Pitre). ARKANSAS - Survey negative in northwest area. (Boyer). NEVADA - Adults active, mating, and laying eggs in Reno and Sparks area, Washoe County. (Bechtel).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Larval averages per 100 sweeps of alfalfa: 150 at Yuma, Yuma County, 500 in Salt River Valley, Maricopa County. Controls applied to some fields. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - ILLINOIS - Larval counts 22 per square foot in alfalfa in southeastern area. (Ill. Ins. Rpt.).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Heavy decline in Salt River Valley of Maricopa County; averaged 100 per 100 sweeps. (Ariz. Coop. Sur.). NEW MEXICO - Light, 3-50 per 50 sweeps, in alfalfa in Mesilla Valley, Dona Ana County. (Elson). ILLINOIS - Averaged 4 per square foot in southeastern area. (Ill. Ins. Rpt.).

LYGUS BUGS (Lygus spp.) - NEW MEXICO - Large numbers, 14 per 10 sweeps, in weeds near one alfalfa field. Very few in alfalfa in Mesilla Valley, Dona Ana County. (Elson). ARIZONA - Counts per 100 sweeps: 10 adults in Salt River Valley, Maricopa County; 40 nymphs at Yuma, Yuma County. (Ariz. Coop. Sur.).

GENERAL VEGETABLES

ONION MAGGOT (Hylemya antiqua) - TEXAS - Damaging onions and peas in Kemp, Henderson County. (Finch).

SALT-MARSH CATERPILLAR (Estigmene acrea) - FLORIDA - Full-grown larvae abundant in old fields of tomatoes and beans overgrown with weeds at Homestead, Dade County. (Habeck et al.).

DECIDUOUS FRUITS AND NUTS

PEACH TWIG BORER (Anarsia lineatella) - WASHINGTON - Observations March 11 indicate only 2 percent alive in hibernation at Wenatchee, Chelan County; 70+ percent survival expected. (Anthon, Smith).

PEAR PSYLLA (Psylla pyricola) - WASHINGTON - Dormant sprays begun March 24 in north-central area; adults laying eggs. Up to 8 adults per tray. Reduction in treated orchards ranged 70-90 percent in lower Yakima Valley. First scattered eggs found in upper Yakima Valley. (Burts, Johnson).

GREEN PEACH APHID (Myzus persicae) - WASHINGTON - First nymphs noted March 17 in orchard in upper Yakima Valley; on March 19, 72 percent of eggs viable, 28 percent collapsed, and 10 percent hatched at Yakima, Yakima County. Lack of pruning in freeze-damaged orchards resulted in unusually large numbers of eggs in lower Yakima Valley. (Johnson, Powell).

APPLE APHID (Aphis pomi) - WASHINGTON - First eggs hatched March 18 at Parker Heights, Yakima County. (Johnson).

PEACH SILVER MITE (Aculus cornutus) - WASHINGTON - Mortality 99 percent in Rock Island area, Chelan County, March 25. (Anthon, Smith).

TWO-SPOTTED SPIDER MITE (Tetranychus urticae) - OREGON - Overwintering forms on buds of pear trees in Jackson County. (Berry).

CITRUS

Citrus Insect Situation in Florida - Mid-March - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 72 (norm 61) percent of groves; 52 (norm 40) percent economic. Above normal and in high range. Infestations on leaves and fruit similar, while increase expected on mature fruit and decrease on mature leaves. Spring leaves likely to harbor important infestations after mid-April. Highest districts south, west, and north. TEXAS CITRUS MITE (Eutetranychus banksi) infested 33 (norm 31) percent of groves; 15 (norm 14) percent economic. Near normal in low range. Increase started, expected to continue. Predicted moderate to heavy for 20-25 percent of groves. Highest districts central and north. CITRUS RED MITE (Panonychus citri) infested 34 (norm 39) percent of groves; 10 (norm 12) percent economic. Slightly below average for this date, in low range. Gradual increase expected, about 15 percent of groves likely to develop moderate to heavy infestations. Highest districts east, west, and south. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) present in 7 percent of groves as light infestations. Slight increase expected. GLOVER SCALE (Lepidosaphes gloverii) infested 69 (norm 80) percent of groves; 5 (norm 16) percent economic. PURPLE SCALE (L. beckii) infested 67 (norm 78) percent of groves; 5 (norm 9) percent economic. YELLOW SCALE (Aonidiella citrina) infested 78 (norm 62) percent of groves; 3 (norm 12) percent economic. BLACK SCALE (Saissetia oleae) infested 21 (norm 30) percent of groves; 6 (norm 13) percent economic. CHAFF SCALE (Parlatoria oleae) infested 34 (norm 61) percent of groves; 1 (norm 9) percent economic. An ARMORED SCALE (Unaspis citri) infested 18 percent of groves; 8 percent moderate to heavy. All above scales at low or moderate levels in all districts. Activity below average for this date, little change expected before mid-April. All populations below normal March levels except U. citri. WHITEFLIES increased, still at low to moderate levels; of little concern. MEALYBUGS below normal and very low. APHIDS present in 10 percent of groves, near average for this date; strong increase expected to occur through mid-April. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

CALIFORNIA RED SCALE (Aonidiella aurantii) - ARIZONA - Two additional infestations reported from Yuma, Yuma County. All infestations treated March 18. (Ariz. Coop. Sur.).

CITRUS RED MITE (Panonychus citri) - ARIZONA - Heavy in one lemon grove at Yuma; eggs and adults average about 80 per leaf. (Ariz. Coop. Sur.).

ORNAMENTALS

BLACK THREAD SCALE (*Ischnaspis longirostris*) - FLORIDA - Adults on 4 of 15 *Gardenia jasminoides* plants at Perrine, Dade County, March 4. (Dillon, Simpson). This is a new Florida Department of Plant Industry host record. (Fla. Coop. Sur.).

CAMPHOR SCALE (*Pseudaonidia duplex*) - FLORIDA - Collected on myrtle, *Myrica rubra*, at Gainesville, Alachua County, February 10 by G.W. Dekle. This is a new Florida Department of Plant Industry host record. (Fla. Coop. Sur.).

AN ARMORED SCALE (*Diaspis boisduvalii*) - TENNESSEE - Moderate to heavy on orchids in 3 greenhouses in Hamilton County. (Bogard). FLORIDA - Collected on *Zamia floridana* at Gainesville, Alachua County, February 26 by G.W. Dekle. This is a new Florida Department of Plant Industry host record. (Fla. Coop. Sur.).

BAGWORM (*Thyridopteryx ephemeraeformis*) - ALABAMA - Survival of overwintered eggs high on cedars and other shrubs from Shelby County north to State line. (McQueen).

A SLUG (*Veronicella moreleti*) - TEXAS - Collected in nursery in Hidalgo County by J.I. Locklar, March 29, 1968; and in nursery in Willacy County by R. Kloepping, April 11, 1968. Determinations by W.J. Byas. (PPC).

FOREST AND SHADE TREES

NANTUCKET PINE TIP MOTH (*Rhyacionia frustrana*) - ALABAMA - Numerous pupae overwintered in tips of isolated 2 to 8-year-old pine trees in street and highway plantings in Madison, Morgan, and other northern counties. (McQueen). TENNESSEE - Damage heavy in 2-year-old pine stand in Haywood County. (White). VIRGINIA - Infestation ranged 90-100 percent in loblolly and Scotch pine Christmas tree plantation in King William County. All observed buds contained pupae. (Weidhass, Andrews).

SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) - TENNESSEE - Aerial survey located several isolated small spots in Roane, Anderson, Campbell, and Union Counties. New faders not present, only old kills. (Applegate).

BLACK PINE-LEAF SCALE (*Nuculaspis pini*) - CALIFORNIA - Medium on pine nursery stock in Saratoga, Santa Clara County. (Cal. Coop. Rpt.).

PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) - VIRGINIA - Very light on few trees in Scotch pine Christmas tree plantation in Buckingham County; trees 2 to 3 feet high. (Weidhass, Baldwin).

SPRUCE SPIDER MITE (*Oligonychus ununguis*) - ARIZONA - Heavy on Italian cypress at Tucson, Pima County. Many trees turning brown. (Ariz. Coop. Sur.).

GREAT BASIN TENT CATERPILLAR (*Malacosoma fragile*) - ARIZONA - Heavy in cottonwood trees at Tucson, Pima County. (Ariz. Coop. Sur.).

SPRING CANKERWORM (*Paleacrita vernata*) - MINNESOTA - First female moths of season reported from St. Paul, Ramsey County. (Minn. Ins. Rpt.).

OBSCURE SCALE (*Melanaspis obscura*) - MARYLAND - Heavy on oak planting in Silver Spring, Montgomery County. Causing dieback on many red and scarlet oaks in wooded areas in Greenbelt, Prince Georges County. (U. Md., Ent. Dept.).

MAN AND ANIMALS

COMMON CATTLE GRUB (*Hypoderma lineatum*) - WYOMING - Averaged 6 per head in untreated animals at Laramie, Albany County, and 9 per head at Torrington, Goshen County, March 10-11. Emergence of larvae peaked about March 15 at Laramie. (Lloyd, Parshall). OKLAHOMA - Averaged 0.1 per head in steers in Payne County and light in Mayes County. Adults active and annoying cattle in Payne County. First report of year. (Okla. Coop. Sur.).

HORN FLY (*Haematobia irritans*) - OKLAHOMA - Light, less than 10 per head, on steers in Payne County. First report of year. (Okla. Coop. Sur.).

FACE FLY (*Musca autumnalis*) - TENNESSEE - Annoying in home in Jefferson County. (Mullett).

CATTLE LICE - MISSISSIPPI - Light to moderate on 50 head of beef cattle in Oktibbeha County. (Dinkins, Mar. 21).

HORSE BITING LOUSE (*Bovicola equi*) - MISSISSIPPI - Heavy on several horses in Oktibbeha County. Treatment required. (Combs).

HOUSEHOLDS AND STRUCTURES

WESTERN SUBTERRANEAN TERMITE (*Reticulitermes hesperus*) - OREGON - Alate forms in flight in Jackson County. (Berry). WASHINGTON - First reports of winged forms, probably this species, in houses in Wenatchee, Chelan County, March 17. (Rushmore).

CLOVER MITE (*Bryobia praetiosa*) - NEVADA - Heavy migrations into homes in southern Washoe County. (Nev. Coop. Rpt.). UTAH - Entering homes in Salt Lake City and Murray area of Salt Lake County. (Knowlton, Mar. 22). TENNESSEE - Heavy in small office building in Knox County. Controls applied. (Applegate). DELAWARE - Many infestations in homes in several areas. (Boys).

BENEFICIAL INSECTS

LADY BEETLES - WASHINGTON - First flights of season as follows: *Hippodamia convergens* (convergent lady beetle) March 11 and *H. apicalis* March 16 at Kiona, Benton County; *Coccinella novemnotata* March 16 at Burbank, Walla Walla County. (Landis). OREGON - Adults of *Adalia bipunctata* (two-spotted lady beetle) very abundant and feeding heavily upon aphids on ornamental maple in Portland, Multnomah County; mating. Moderate numbers of convergent lady beetle adults flying in hills near Falls City, Polk County. (Westcott). ARIZONA - Convergent lady beetle larvae averaged 30 per 100 sweeps of alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.). NEW MEXICO - Lady beetles increasing in alfalfa near Roswell, Chaves County; ranged 3-8 per square foot, 50 percent larvae. (Mathews). Averaged 1 per 50 sweeps in alfalfa in Mesilla Valley, Dona Ana County. (Elson). ARKANSAS - First convergent lady beetle adults of season March 28. Ranged 20-30 per 100 sweeps in wheat and oats in northwest area. (Boyer).

HONEY BEE (*Apis mellifera*) - ARIZONA - Late spring caused heavy loss of overwintering colonies. Negligible amount of pollen available. Lack of brood depleted many colonies in Yuma and Maricopa Counties. Major shortage expected for citrus pollination. Many colonies destroyed in Salt River Valley because of heavy foulbrood outbreak. (Ariz. Coop. Sur.).

FLOWER BUGS (*Orius* spp.) - ARIZONA - Averaged 40 adults per 100 sweeps of alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.).

GREEN LACEWINGS (*Chrysopa* spp.) - ARIZONA - Averaged 30 larvae per 100 sweeps of alfalfa at Yuma, Yuma County. (Ariz. Coop. Sur.).

A PHYTOSEIID MITE (Zetzellia mali) - WASHINGTON - Examination of duff in prune orchards in lower Yakima Valley indicates poor winter survival. (Anthon, Smith, Mar. 21).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - TENNESSEE - Survey completed in Pickwick Dam and Counce area in Hardin County. Boats used to survey shoreline from Mississippi State line to Pickwick Dam. Survey negative. (Turpin). Surveys in Bradley, De Kalb, Giles, Hamilton, Lincoln, Maury, and Rhea Counties negative. (Harris et al.).

PINK BOLLWORM (Pectinophora gossypiella) - CALIFORNIA - First nonsterile moth of 1969 season taken in sex lure trap at Anza Ranch, Borrego Springs, March 7. This is 19 days earlier than in 1968 when first record of season in Thermal, Riverside County. (Cal. Coop. Rpt.).

A SEED CHALCID (Megastigmus pistaciae) - CALIFORNIA - Studies reinitiated at Chico. Caged nuts, checked daily, showed no adult emergence to March 28. Of nuts on ground 90 percent moldy and rotted; may not support seed chalcid. Thirty stickyboard traps placed in two pistachio orchards outside Plant Introduction Station in Butte County. (Cal. Coop. Rpt.).

WHITE GARDEN SNAIL (Theba pisana) - CALIFORNIA - Herbicides applied to vegetation in vacant lots within infested area of Manhattan Beach, Los Angeles County, to eliminate food supply and increase bait acceptance; 5 properties treated. Inspection showed treatment successful. Second baiting completed. (Cal. Coop. Rpt.).

WOOLLY WHITEFLY (Aleurothrixus floccosus) - CALIFORNIA - Survey completed on 40 city blocks in San Diego, San Diego County; 29 infested. Confirmed infested blocks now 600. Survey centered in area between or adjacent to older infestations. Treated 296 trees on 116 properties. One live infestation recorded during check of 28 sprayed properties; mortality 96 percent in this infestation. (Cal. Coop. Rpt.).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainsville - 3/22-27, BL - Armyworm (Pseudaletia unipuncta) 1, black cutworm (Agrotis ipsilon) 5, granulate cutworm (Feltia subterranea) 14, saltmarsh caterpillar (Estigmene acrea) 2. TEXAS - Brownsville - 3/8-21, 2BL, 42-82°F, precip. .08 - Armyworm 25, black cutworm 56, cabbage looper (Trichoplusia ni) 1, corn earworm (Heliothis zea) 75, granulate cutworm 4, pale-sided cutworm (A. malefida) 107, tobacco hornworm (Manduca sexta) 3, tomato hornworm (Manduca quinquemaculata) 1, variegated cutworm (Peridroma saucia) 7, yellow-striped armyworm (Prodenia ornithogalli) 1. TEXAS - Waco - 3/17-27, BL - Armyworm 9, granulate cutworm 3, variegated cutworm 14.

CORRECTIONS

CEIR 19(10):149 - SOUTHERN PINE BEETLE (Dendroctonus frontalis) - ARKANSAS - First sentence should read: Detection flights by U.S. Forest Service and Arkansas Forestry Commission personnel made in Ashley County, February 24, 1969.

CEIR 19(13):212 - CHINCH BUG (Blissus leucopterus) - KANSAS - Delete note; figures in error. See page 236 in this issue for corrected note. (PPC).

HAWAII INSECT REPORT

New State Record - Two specimens of a SPHECID WASP (*Pison punctifrons* Shuckard) collected at Ewa, Oahu, determined by J.W. Beardsley; one collected in March 1960, the other in August 1961. This is fifth species of genus to occur in State; probably not recognized earlier because of superficial resemblance to other species. Apparently all species of genus prey on small spiders. *P. punctifrons* is widespread in Southeast Asia, the Philippines, and Micronesia. This wasp may construct either free cells, or partition holes in timber, and provisions the cells with small spiders. (Beardsley). This is a new Western Hemisphere record, but the species is not known to occur in the continental United States. (PPC).

General Vegetables - BEAN FLY (*Melanagromyza phaseoli*) larvae trace to light in seedling snap beans at Waimanalo and Waianae, Oahu. Only 1-5 percent of seedlings in some fields heavily infested; adults light on foliage. Adults medium on leaves of seedling yard-long beans on farms at Waimanalo and in backyards at Ewa; larvae light in leaves and stems. Larval damage and adults medium in backyard snap beans at Waikapu, Maui. (Funasaki, Ah Sam). LEAF MINER FLIES (*Liriomyza* spp.), GREENHOUSE WHITEFLY (*Trialeurodes vaporariorum*) and CARMINE SPIDER MITE (*Tetranychus cinnabarinus*) light to heavy in many fields of snap beans, cucumbers, and tomatoes in Waianae, Waimanalo, and scattered plantings in other areas on Oahu; expected to be troublesome on these and several other crops for next six months. (Yamamoto, Sato). Two adults of a STINK BUG (*Plautia stali*) found on buds of beans; one at Waianae, Oahu, on long beans and other at Waimanalo on snap beans. This stink bug, a pest of fruits and beans in Southeast Asia, repeatedly collected at light in many areas, sometimes in large numbers, since January 1968. However, no significant infestations found to date on fruit trees, beans, or other plants. (Suzukawa, Mitchell). GREEN PEACH APHID (*Myzus persicae*), carmine spider mite, and greenhouse whitefly light to medium on most eggplants in Waianae, Waimanalo, Pearl City, Punaluu, and Koko Head, Oahu. (Funasaki).

Fruits - SOUTHERN GREEN STINK BUG (*Nezara viridula*), mostly adults, heavy on foliage and fruits in 5 acres of mixed citrus and on cheeseweed in Kihei, Maui. No apparent damage to citrus. Eggs of *Trichopoda pennipes* (a tachina fly) on 77 percent of 200 adults collected. (Miyahira). PURPLE SCALE (*Lepidosaphes beckii*) heavy on bark of 3-year-old citrus trees in Lihue, Kauai. (Sugawa). A SOFT SCALE (*Coccus acuminatus*) moderate on mountain-apple trees in Hilo, Hawaii; sooty mold noticeable on leaves. (Yoshioka). An APHID (*Pentalonia nigronervosa*) spotty and heavy in some banana fields at Waimanalo, Waiahole, Kaneohe, and in backyards at Laie, Oahu. Infestations mostly between leaf axils of young plants. BLACK THREAD SCALE (*Ischnaspis longirostris*), RED WAX SCALE (*Ceroplastes rubens*), and an ARMORED SCALE (*Phenacaspis cockerelli*) light to medium on leaves of 5 acres of mango in Kihei, Maui. (Miyahira).

Beneficial Insects - A PTEROMALID WASP (*Anysis alcocki*), a parasite of scale insects purposely introduced from the Philippines in 1964, previously reported attacking only *Ceroplastes cirripediformis* (barnacle scale). In January both sexes reared from *Saissetia coffeae* (hemispherical scale) on asystasia, and males only reared from *Asterolecanium bambusae* (a pit scale) on bamboo, in Honolulu, Oahu. New host records in Hawaii. (Beardsley).

Miscellaneous Insects - Survey of 300-acre grass area at Hickam Air Force Base, Honolulu, Oahu, revealed only 2 third-instar nymphs of a GRASSHOPPER (*Oedaleus abruptus*). Area cooperatively treated March 12-13 by Federal and State personnel. (Olson). Adult male of a LONGHORN GRASSHOPPER (*Euconocephalus nasutus*) picked up at large on farm at Waianae is sixth known specimen taken to date on Oahu. (Konishi).

INSECT DETECTION

New State Records

A SPHECID WASP (Pison punctifrons Shuckard) - HAWAII - Two specimens collected at Ewa, Oahu, determined by J.W. Beardsley; one collected in March 1960, the other in August 1961. Apparently all species of this genus prey on small spiders. This is first record for Western Hemisphere. P. punctifrons is not known to occur in the continental United States. (p. 241).

TEPHRITID FLIES - WISCONSIN - Procecidochares atra collected in ammonia bait traps in cherry orchards in Door County July 1968. Determined by G.C. Steyskal. (Conrad). OREGON - The following species collected by K. Goeden and determined by F.L. Blanc: Aciurina thoracica in Klamath County August 6, 1966; Tephritis opacipennis in Deschutes County June 6, 1963; Trupanea femoralis in Klamath County June 6, 1966, and in Jackson County June 7, 1966. (Westcott).

LESSER MEALWORM (Alphitobius diaperinus) - WISCONSIN - Found in turkey litter at Barron, Barron County, December 12, 1968. Determined by T.J. Spilman. (Conrad).

A WHITEFLY (Aleuroplatus quercusaquaticae) - TEXAS - Found attacking post oak near Houston, Harris County, August 12, 1968, by R.M. Eads. Determined by L.M. Russell. (Eads).

AN EPIDERMOPTID MITE (Dermatophagoides pteronyssina) - CONNECTICUT - Heavy in rug and upholstered furniture in home in Meriden. (p. 253).

Weather of the week continued from page 234.

ward to Arkansas and the Carolinas. Snow mixed with rain fell along the western edge of the precipitation area and blustery winds, gusting to 30 to 45 m.p.h. from the Dakotas to Texas and eastward to the middle Atlantic added to the people's misery. Tornadoes struck in Virginia Monday night, killing 1 person, injuring several, and destroying or severely damaging 15 to 20 homes and several apartment buildings. A new storm pushed into the northern Great Plains on Thursday. Light rains from Missouri to Illinois preceded the storm surge which dumped fresh snow from Minnesota to Upper Michigan, 5 inches at Minneapolis. Flurries fell from the northern Rocky Mountains to the Dakotas. Northern and western New York received 3-6 inches of new snow about midweek.

TEMPERATURE: Pleasant sunny weather continued over most of the West. A rising temperature trend produced the warmest temperatures of the year in California. Thermal, California, registered 97° on Friday and Saturday afternoon. In contrast, cold air spilled southward over the central and eastern States. Tallahassee, Florida, registered 28° Thursday morning, setting a new low-temperature record for so late in the season. Cool temperatures over the northern Great Plains, low 40's in the afternoon and below freezing at night, slowed the melting of the deep snow cover in the Red River of the North Valley and the valleys of the Big Sioux and other tributaries of the Big Muddy. As the weekend approached, a fresh blast of arctic air swept southward across the central Great Plains, tumbling temperatures to below zero as far south as northeastern Nebraska and northern Iowa.

FLOOD SITUATION AND OUTLOOK: The northern tributaries of the middle Missouri River are rising rapidly due to snow melt and will exceed flood stage during the next few days. Principal tributaries are the Little Sioux, Floyd, James, and the Big Sioux. The snowpack has not yet begun to thaw in the upper Mississippi and the Red River of the Northern basins, and the flood potential remains high in those areas. (Summary supplied by Environmental Data Service, ESSA.)

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1968

(Continued from page 232)

MAN AND ANIMALS

Highlights:

MOSQUITOES were annoying in many areas of the United States during 1968 and were heavier than usual in some areas. FACE FLY was found for the first time in California and Nevada and is now known to occur in most counties of Montana. Face fly was annoying to livestock in many areas and is the most troublesome fly species of livestock in Maryland. HOUSE FLY was numerous about poultry houses in Utah and was of much concern around hog and poultry operations in Alabama. SCREW-WORM was the worst in the Southwest since 1962, with a total of 9,877 confirmed cases. HORN FLY was heavy in many areas of Texas and southern Illinois and remained the most important pest of range cattle in North Dakota. STABLE FLY was very annoying to untreated cattle in Iowa and annoyed cattle in the Boise Valley of Idaho for the first time in several years. HORSE FLIES, DEER FLIES, and BLACK FLIES were annoying in some areas. CATTLE LICE were problems in some areas, and several species were serious in Alabama. SHEEP BITING LOUSE was an important pest in Texas. AMERICAN DOG TICK populations were much lower than in 1967 in Wisconsin. WINTER TICK was heavier than in many years in Oklahoma.

MOSQUITOES (Aedes spp.) were heavy throughout VERMONT. In southern NEW HAMPSHIRE a heavy spring brood of Aedes spp. emerged in early May. Culex spp. and Aedes spp. were prevalent throughout RHODE ISLAND by July 9 and continued a nuisance throughout the summer. Mosquitoes were more abundant in CONNECTICUT in 1968 because of a wet spring. In DELAWARE the three major species, SALT-MARSH MOSQUITO (Aedes sollicitans), A. vexans, and Culex pipiens, were not so abundant as last season. Mosquito populations in MARYLAND were 26 percent lower in 1968 than in 1967. Of all the females collected from 21 traps in 16 counties, Aedes sollicitans accounted for 24.8 percent, and Culex spp. represented 30.5 percent. Female Culex spp. decreased from 57 percent of the total in 1967.

Psorophora confinnis was relatively more abundant in the Palm Beach County area of FLORIDA because of more rain in 1968. The species was most active in late spring and during summer. The mosquito nuisance was greater than usual and serious all summer in the Sanford area of Seminole County. At a large dairy near Green Cove Springs, Clay County, the entire pasture area had to be treated in September. A. sollicitans was the worst in about 10 years in the panhandle section. Probably reflecting an early spring drought and several summer storms, A. taeniorhynchus peaked in extreme southeastern Florida in late May and in the central east coast area during June and July. Salt marsh Aedes were more abundant during September and October in the western area where a dry summer was followed by locally heavy rains and possibly some peak tides late in the season. The number of cases of equine encephalitis (36) was twice that of 1967. One human in the Homestead area of Dade County, Florida, was infected with Venezuelan encephalitis during September.

COMMON MALARIA MOSQUITO (Anopheles quadrimaculatus) probably transmitted 4 confirmed cases of human malaria in Lee County, ALABAMA. These cases were the first reported in the State since 1960 by the Alabama Department of Health. Aedes sollicitans and other mosquitoes were annoying throughout the season, especially along the coastal areas and lakes. Various species, as usual, severely annoyed man and animals in all low areas of ARKANSAS. Numbers in OKLAHOMA were generally light. Culiseta inornata was fairly common in April and October. Culex pipiens complex and Aedes spp. caused occasional trouble during fall in Oklahoma.

Floodwater mosquitoes in most of OHIO were exceptionally heavy and annoying during June. Heavy rains in May left standing water in depressions. Mosquitoes, mostly *Aedes vexans*, reached very annoying levels in northern INDIANA because of extremely wet conditions in late May; by mid-July annoyance was severe in the central and northern areas. Populations were described as "worst ever" and "worst in 15 years" during 1968. Mosquitoes in MICHIGAN were of primary concern after July. The enormous numbers made camping and other outdoor activities unpleasant. Chemical controls statewide were only partly effective because large community control projects and water management are needed. The first NORTHERN HOUSE MOSQUITO (*Culex pipiens pipiens*) in WISCONSIN was caught in the Mazomanie blacklight trap by April 5. By May 17, FLOODWATER MOSQUITO (*A. sticticus*) was biting in Iowa County. By June 14, biting of man and cattle was severe in all counties. Late in June heavy rains provided breeding pools. Not until the first week of August did biting become localized. *A. vexans* was by far the most numerous biter in Wisconsin with *A. sticticus* second.

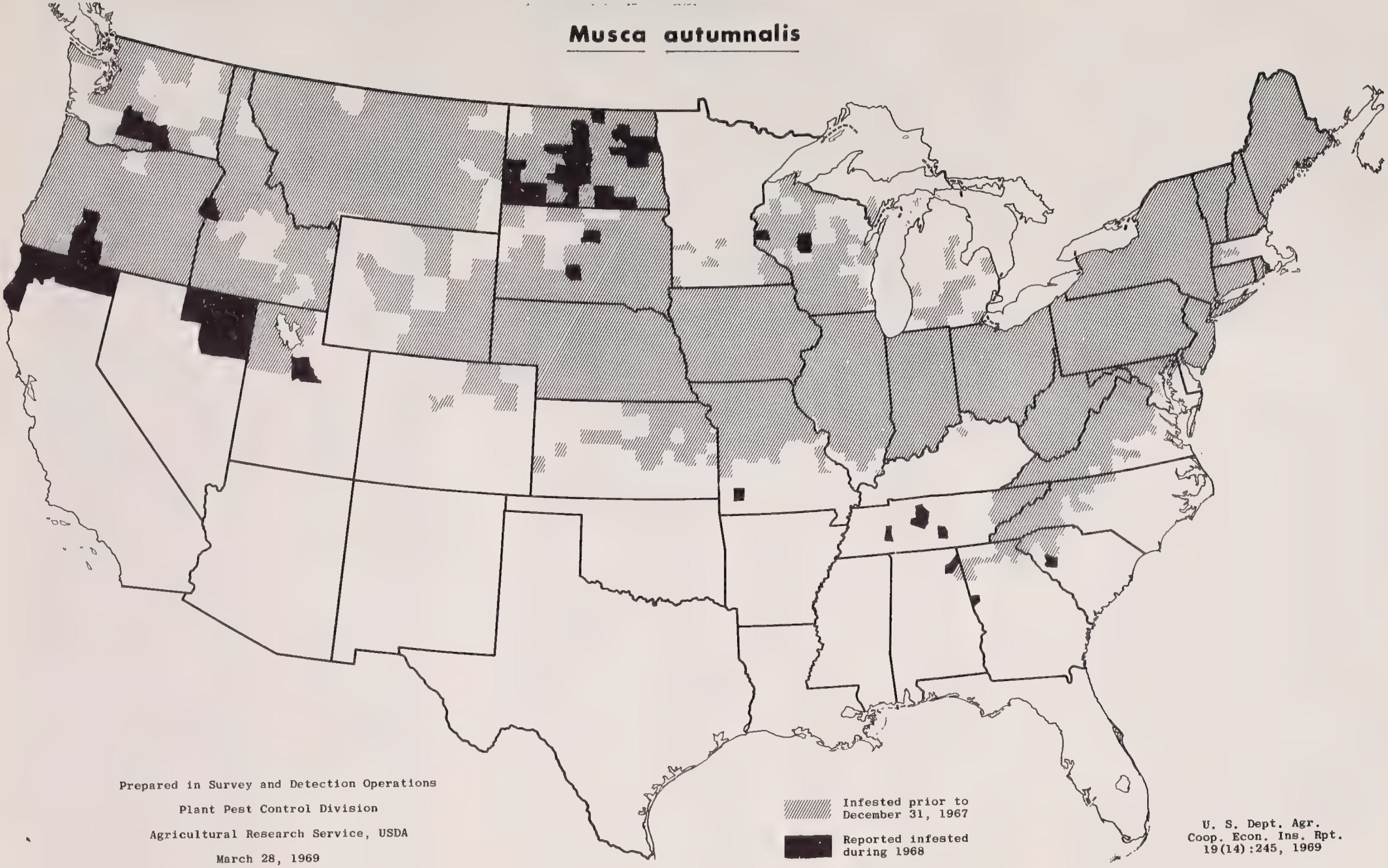
The first spring *Aedes* spp. and *A. vexans* in MINNESOTA emerged May 11-17. By June 15, adults had sharply increased with warmer weather. Nuisance, particularly in the southern half of the State, was high. In late June cooler weather restricted activity somewhat. In late June *Mansonia perturbans* appeared, remained in significant numbers until its peak in mid-July, and then declined in August. Very heavy rains from late June through August led to widespread mosquito breeding and high nuisance levels. Adult control programs by municipalities were often unsuccessful. Peaks were noted during the weeks ending July 13 and August 17. *A. vexans* was predominant throughout the season. By August 9, *A. trivittatus* was significant. After August 23 declining temperatures restricted activity. By September 13 the diapause level of *Aedes* eggs was 65 percent. The 1968 season in Minnesota may be considered the worst mosquito year of the past 10 years with 1967 being a close second.

Mosquitoes were severe throughout IOWA in 1968. Many cities and towns sprayed or fogged. The first activity in NEBRASKA was reported April 9 in Lancaster County. Problems were fewer statewide than in 1967, but locally heavy infestations occurred, particularly in the northwestern panhandle. In August a case of equine encephalitis was reported from Chadron, Dawes County. In SOUTH DAKOTA much more ultra low volume organic phosphate was used to control horn fly (*Haematobia irritans*), face fly (*Musca autumnalis*), and mosquitoes than in 1967 with an estimated 400,000 head of cattle treated. Mosquitoes were heavy in most areas of NEW MEXICO after heavy summer rains. Because of the threat of encephalitis, the area along the Rio Grande from Belen, Valencia County, to Velarde, Rio Arriba County, was treated, as well as the river valley from Espanola to Abiquiu. Heavy mosquito populations throughout WYOMING annoyed man and animals. Heavy rains flooded many areas. Populations were heaviest in Teton, Lincoln, Sublette, and Albany Counties. Mosquitoes were among the three most troublesome and common pests of livestock in UTAH during 1968 and were a problem in homes. Populations throughout NEVADA were generally low because of drought. Outbreaks of several species of *Aedes* and two species of *Culex* did occur in localized areas. Numbers were higher than normal and irritating in many local CALIFORNIA areas. *Aedes dorsalis* was very abundant and severely annoyed cattle in Langel Valley, Klamath County, OREGON, during June. Sixty-five cases of equine encephalitis in horses were reported in 1968 compared with 20 cases in 1967. Cases were reported from Crook, Deschutes, Douglas, Grant, Jackson, Josephine, Klamath, Lake, Morrow, Wasco, and Washington Counties. The single Washington County case was the first reported in 13 years. Most cases occurred in Jackson County. Mosquitoes were generally less abundant than last year in Oregon.

FACE FLY (*Musca autumnalis*) was collected in 1968 for new State records in CALIFORNIA and NEVADA. In Nevada light to medium populations developed in north-central Elko County during summer. Face fly was much less of a problem than during the summer of 1967 in WASHINGTON. Counts ranged 1-5 per beef animal at Prosser, Benton County, in July, 4-5 per head in Whitman County, and were

Distribution of Face Fly

Musca autumnalis


▨ Infested prior to December 31, 1967
■ Reported infested during 1968

Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA
March 28, 1969

U. S. Dept. Agr.
Coop. Econ. Ins. Rpt.
19(14):245, 1969

generally low in the lower Yakima Valley. The parasitic nematode (Heterotylenchus autumnalis) infested about 34 percent of the face flies examined. Counts of 50 per head, common in 1967, were rare in 1968. Newly emerged face fly adults were observed on cattle in northern IDAHO by May 31. Counts ranged 0-26 flies per face on several beef herds. Adults averaged 14 per face on untreated Boundary County cattle in mid-July but were very low or absent on pasture cattle in the southeastern area in early July and in the southwestern area in early August. Annoying numbers were observed on range and pasture cattle in widely separated areas of Idaho in late July and early August. Many areas which experienced economic numbers in 1967 did not in 1968. A cool, wet August suppressed development for the rest of the summer. Face fly has been in MONTANA only 5 years but is known to occur in all but 7 of the 56 counties. Fewer flies appeared on the faces of livestock in 1968 than in 1967. By late summer H. autumnalis had parasitized more than 40 percent of the face fly population. In the fall, face flies annoyed householders by entering homes in large numbers. No face flies were observed or reported in WYOMING during 1968. In northern UTAH this pest was common, and populations and annoyance were normal.

Face fly activity in NEBRASKA increased in June and peaked in late August to early September. Populations in SOUTH DAKOTA were lower than in 1967. There were usually one to three per head from July until mid-August when up to 35 per head of stock were observed in Brookings, Charles Mix, and Yankton Counties. New county records were established in Jones and Potter Counties, although this pest was presumed to have been there for several years in low numbers. Use of an ultra low volume organic phosphate to control horn flies, face flies, and mosquitoes continued on a larger scale than in 1967, with an estimated 400,000 head of cattle treated. Face fly populations throughout most of NORTH DAKOTA were noneconomic. However, up to 30 per face annoyed animals in the sand hills area of Ransom and Richland Counties. Reported in 23 new counties in 1968, face fly is now recorded in all but Williams and Divide Counties. Face fly was troublesome in most areas of IOWA. In ILLINOIS counts averaged 33 per animal in August in the central section, with a State average of 9.8 per animal. Face fly was severely annoying on pasture cattle from mid-July through mid-August throughout INDIANA. In the southern areas, counts ranged 11-62 per face, but in the central and northern areas populations ranged 15-100+ per face and averaged 40 per face. Face fly was the heaviest since the survey program in Indiana began in 1964. Face fly adults had emerged from hibernation to annoy cattle in southern OHIO with the first warm weather of early April. In April and early May, 6 and 7 per face were reported. However, numbers did not become significant until mid-July when populations increased rapidly. During the last half of July and August up to 50 flies per face, "tear streaking", and tightly clustered groups of cattle were reported. Face fly appears to be annoying cattle farther north each year in MICHIGAN.

Face fly is the most troublesome fly of MARYLAND livestock. High numbers, 40-150 per head, commonly infested cattle and horses in the central sections in 1968. Controls on beef cattle were not satisfactory. A daily spray program on dairy cattle did not prevent moderate to heavy infestations in the field. Face fly was a severe nuisance in western VIRGINIA. In TENNESSEE face fly was reported in Coffee, Davidson, Decatur, and Williamson Counties for new county records. Annoyance to cattle was high in many eastern areas.

HOUSE FLY (Musca domestica) occurred in seasonal outbreaks while it was otherwise normal in CALIFORNIA. Numbers were above normal in late summer in several UTAH communities and especially numerous about some poultry houses and on many farms. Annoyance in OKLAHOMA occurred around homes and barns from early March to mid-November, and this pest was troublesome in IOWA. House fly adults became numerous in some dairy barns in WISCONSIN late in May. Early in August a marked increase occurred. With longer and cooler August nights annoying numbers entered houses and restaurants statewide. House fly was an annoying and serious health hazzard throughout ALABAMA. Large numbers entered homes near dairy barns and poultry houses. Annoying numbers of adults were of considerable concern around hog production and poultry operations in Alabama. In FLORIDA house fly was present at all times throughout Palm Beach County. House fly was highest in cattle and horse barns and abundant in pastures around molasses and concentrate feed troughs where they would settle on cattle and feed on punctures made by Haematobia irritans (horn fly). Large numbers of house fly occurred in Bradford County because of inadequately treated manure in large scale poultry operations. All stages heavily infested chicken houses by August 20 in RHODE ISLAND, but the usual numbers were present elsewhere during summer.

The 1968 season was the worst for SCREW-WORM (Cochliomyia hominivorax) outbreaks since 1962 when the United States Department of Agriculture, the States, and the Southwest Animal Health Research Foundation launched the cooperative eradication program. Prior to the resurgence, cases had dropped from 50,850 the first year to only 872 in 1967. In 1968, confirmed cases totaled 9,877; Texas had 9,268, Arizona 405, California 135, and New Mexico 69. In 1967 Texas had 835 cases, Arizona 23, California 14, and New Mexico none. A total of 2,942,889,000 sterile flies were released in the United States during 1968.

There were 19,452 laboratory-confirmed cases of screw-worm in the Mexico portion of the barrier zone. A total of 4,211,947,000 sterile screw-worm flies was released over Mexico.

Strangely enough, 1968 also included the longest screw-worm free period on record, 101 days, which immediately preceded the 1968 outbreak. Intensive eradication efforts had eliminated screw-worm from the United States; however, a large native screw-worm population spread northward from Mexico into the Southwest, causing a peak of 4,155 cases during October.

Since November, cases have dropped off sharply, but officials warn that this is due to cold weather rather than a lessening of the screw-worm menace.

Veterinarians of the Agricultural Research Service attribute the screw-worm resurgence to two major causes: (1) unusually wet and mild weather throughout the Southwest which favored rapid screw-worm spread and hindered eradication efforts, and (2) relaxed preventive measures by many ranchers. If the border region has a mild winter and these conditions continue, they fear an even worse outbreak in 1969.

Program officials are urging all animal owners to inspect their stock regularly, report suspected infestations, treat all wounds with approved smears, and spray herds with prescribed pesticides. Larval samples should be sent to the Screw-worm Eradication Laboratory, Mission, Texas, for identification. Branding and animal surgery should be done between now and early spring while the screw-worm threat is at a low ebb.

In addition to the outbreak and the unusual weather, other program highlights were: The largest production and distribution of sterile screw-worm flies ever achieved, ranging from 96 million to nearly 200 million per week from June through November. The death of a 41-year-old Texas woman from a screw-worm infestation, the first such case in many years. A drastic cutback in sterile fly production in December to conserve program resources, which had been strained by the unusually intensive eradication efforts during the height of the 1968 outbreak.

COMMON CATTLE GRUB (Hypoderma lineatum) larvae were found in only 2 of 141 animals examined December 10 on the range cattle experiment station at Ona, Hardee County, FLORIDA. At Gainesville, Alachua County, one first instar infested 6 percent of beef and 9 percent of dairy cattle in early October. Infestations in dairy cattle had increased to 4 percent by late November with 1.3 grubs per infested animal. In mid-December, first to third instars averaged 6 (peak 22) per infested animal in 73 percent of the beef cattle and 4 (peak 16) in 16 percent of the dairy cattle. In Palm Beach County, counts in 1968 were less than in previous years. Grubs ranged 0-46 per head in animals examined January 19 and October 30 and averaged 2.68 and 4.0 per head on those dates, respectively.

Although statewide in ALABAMA and especially important in beef cattle, common cattle grub populations and damage ranged light to medium, probably because of better and widespread use of proper pesticides. Common cattle grub ranged 3-55 (average 19) per back in untreated cattle in January in ARKANSAS. Fall infestations were later and lighter than normal. In OKLAHOMA, larvae were present in backs of cattle through early March, adults were active during March and April, and grubs appeared again in early November. First common cattle grubs of the season in IOWA were found in the backs of cattle during the week of February 9. CATTLE GRUBS (Hypoderma spp.) populations were normal in UTAH and near normal in NEVADA during 1968. The occurrences of common cattle grub and NORTHERN CATTLE GRUB (H. bovis) were normal in CALIFORNIA. Shipments of cattle from out of State accounted for most infestations.

Cattle grub egg laying activity was heavy in northern IDAHO and in the Bruneau area throughout June. Common cattle grub and northern cattle grub were active in 36 counties of MONTANA. Cattle grubs appeared in the backs of cattle in western NORTH DAKOTA by February 22 and were still evident by May 10. Surveys at livestock auctions at Dickinson, Stark County, and at Mandan, Morton County, showed 39 percent of the animals infested with 1-43 (average 7.9) grubs per back. Populations equaled those of 1967, but the percent of infested animals decreased from 59 in 1967 to 39 in 1968. Infestations in western North Dakota were light in 70, medium in 20, and heavy in 8 percent of the infested animals. Northern cattle grub appeared in the backs of cattle in central and west-central IOWA in early March, and infested animals were first reported at locker plants at the same time.

HORN FLY (Haematobia irritans) ranged moderate to heavy, 20-300 per head, on cattle in all the central counties of MARYLAND. Controls reduced numbers somewhat on dairy stock. In Palm Beach County, FLORIDA, moderate numbers infested cattle from January to March. Increase brought the average per head to more than 400 by mid-May and more than 500 by the end of June. Populations peaked at 700 per head on October 29. In 1967, a much drier year, a high of only 560 flies was reached on November 10. In the Gainesville area, Alachua County, counts ranged 300-400 per head on beef and dairy cattle at the end of August and then dropped to less than 50 per head by late October. Late in the season counts were higher on beef than on dairy cattle. Annoying and damaging numbers in ALABAMA occurred mainly on beef herds where proper controls were not applied. Numbers in ARKANSAS were lighter than normal, 100-150 per head, by mid-June but became normal for the rest of 1968. Horn fly activity in OKLAHOMA lasted from late March through mid-November. The highest counts, 600-1,500 per head, occurred from late June to early July and in September. While heavy numbers in TEXAS infested cattle throughout many areas, infestations were heaviest in the Trans-Pecos area.

Horn fly was numerous throughout MICHIGAN with counts as high as 400 per head in August. Counts in southern INDIANA peaked in mid-July and ranged 100-800 (average 200) per head. The generally light counts in the west-central, central, and northern districts peaked in mid-August and ranged 25-50 per head. Counts in the east-central district were the highest with an average of 250-300 per head in mid-August. Horn fly populations averaged 555 per animal in southern ILLINOIS in August, but the State average was 141.2 per animal. This fly was troublesome in most of IOWA. Counts in NEBRASKA increased steadily from May through August; the highest counts, 600-1,000 per head, occurred in late August and early September.

Horn fly populations in SOUTH DAKOTA followed the pattern of 1967 with high counts from mid-June through September. Flies averaged 175 per side on untreated cows east of the Missouri River until the end of July and then increased to 200-250 per side on cows until heavy frosts in September. Peak counts were up to 700 per side on cows and 1,000 on bulls. Use of an ultra low volume organic phosphate to control horn fly, face fly, and mosquitoes continued on a larger scale than in 1967 with an estimated 400,000 head of cattle treated. Horn fly remained the most important pest on range cattle in NORTH DAKOTA. Low numbers built up to economic levels by the end of the season. Counts of 40-700 per head annoyed untreated cattle throughout WYOMING. In UTAH this was one of the three most troublesome and common pests of livestock. Horn fly infestations were near normal in NEVADA.

STABLE FLY (*Stomoxys calcitrans*) appeared in significant numbers on some west FLORIDA beaches the last half of August as usual. During September and October flies were numerous on some beaches and low elsewhere. The season was over by November 1, somewhat earlier than in the last several years. Occasionally a problem on cattle in VIRGINIA, stable fly was generally light. High numbers in southwestern PENNSYLVANIA from mid-June to late July annoyed cattle and workmen in dairy barns. Counts in central ILLINOIS peaked in August and averaged 34 per head; the State average was 8.2. Stable fly in IOWA was very annoying to untreated herds in mid and late summer. Adults in Lancaster County, NEBRASKA, were first seen on March 8, the earliest record of activity in the State, and last seen on November 22. A buildup in June reached 8-10 per leg in feedlots on June 27 and highs of 30-35 per leg from late July through August 10. Activity then declined. Stable fly was active from early April to late November in OKLAHOMA, counts ranged up to 20 per head in mid-April but were generally less than 10 per head during the rest of the season. This pest was common but normal in numbers and annoyance in UTAH. Stable fly harassed cattle in the Boise Valley of IDAHO for the first time in several years. Stable fly was unusually abundant in parts of the Willamette Valley of OREGON during fall.

HORSE FLIES were unusually prevalent and irritating in CALIFORNIA. These pests were very low in most areas of OREGON although a few instances of severe annoyance were reported in Klamath County. Horse flies were common in UTAH, but populations and annoyance were normal. *Hybomitra frontalis* and *Tabanus* spp. annoyed man and animals throughout WYOMING with heaviest populations observed in Teton, Sublette, and Albany Counties. STRIPED HORSE FLY (*Tabanus lineola*) was present in economic numbers on several cattle herds in Steele, Foster, and Sheridan Counties, NORTH DAKOTA. *Tabanus* spp. were annoying to cattle in OKLAHOMA from late April to late September. Populations were heaviest, 20-35 per head, in mid-June and early September. The common species were *T. lineola* complex, *T. sulcifrons*, and BLACK HORSE FLY (*T. atratus*). Horse flies were very heavy in several areas of TEXAS. Heaviest infestations were reported from the Coastal Plains near Angleton, Brazoria County. *Tabanus* spp. were heavier than usual over most of southwestern TENNESSEE during early summer. *Tabanus* spp. were common but not numerous by July 9 in RHODE ISLAND, but counts were increasing on July 17 and July 24.

DEER FLIES were common but normal in UTAH. *Chrysops* spp. annoyed man and animals throughout WYOMING with largest populations noted in Teton, Sublette, and Albany Counties. Deer flies in MINNESOTA were extremely numerous especially in wooded areas. *Chrysops* sp. began annoying humans in early June in southern Dane County, WISCONSIN. Increase was gradual until late July and then rapid during hot weather. Severe for a few weeks, annoyance then subsided in late August. In RHODE ISLAND *Chrysops* spp. were striking and biting on July 9; they were fairly numerous July 17, July 24, and August 7.

BLACK FLIES in NEW HAMPSHIRE began to be active in late April; numbers were about average. *Simulium* sp. in RHODE ISLAND was common and biting on July 9. Complaints about black flies in CONNECTICUT increased probably because of a wet spring producing better breeding locations. *Prosimulium* sp. in PENNSYLVANIA was abundant and annoying in late April in the Pocono resort area. *Simulium* sp. was very numerous in Forest and Warren Counties of the Cook Forest Park during June. Annoyance in both areas, however, was much less severe than in the past few years. Black flies were not important except in localized areas in the northern counties of WISCONSIN where numbers were heavy sporadically through the summer. In mid-July TURKEY GNAT (*S. meridionale*) emerged very heavily over much of the State. Biting of humans was common July 12-19 within 25 miles of the Wisconsin and Mississippi Rivers. Black flies in MINNESOTA were probably more abundant than in past years. Several Simulium spp. were taken from a horse's ear in MONTANA, and great numbers were found around a meat packing plant near Missoula, Missoula County.

These Diptera were also annoying. HORSE BOT FLY (Gasterophilus intestinalis) was common and above normal in UTAH and was active in late September and October in OKLAHOMA. Abundant numbers of a MARCH FLY (Dilophus sp.) in some areas of the FLORIDA Peninsula and of another MARCH FLY (Plecia nearctica) in the northern area in June, late September, and early October were a driving hazard for motorists. A BITING MIDGE (Culicoides furens) remained the principal species in coastal FLORIDA. C. tissoti was abundant and biting people at Orange City, Volusia County, in late March; heavy numbers in western Gainesville, Alachua County, forced baseball fans at City Park to use repellents during April. Culicoides spp. in RHODE ISLAND were common and biting on July 10.

A LOUSE FLY (Lipoptena mazamae) was active on deer in east-central OKLAHOMA from mid-January to mid-September. Numbers ranged up to 3,000 per head from mid-August to mid-September. SHEEP KED (Melophagus ovinus) averaged 150 per head on shorn lambs in Lancaster County, NEBRASKA, March 8. Many flocks in UTAH were treated to control the usual numbers of sheep ked. Sheep ked was widespread in MONTANA. Another species of Melophagus was found infesting deer in the Gallatin Forest.

CATTLE TAIL LOUSE (Haematopinus quadripertusus) in FLORIDA was heavy on practically all beef cattle at Ona, Hardee County, in early December; numbers were much lighter in the Gainesville area, Alachua County. None were observed on dairy animals surveyed. Most scattered infestations in Palm Beach County were found during the cooler months of 1968. SHORT-NOSED CATTLE LOUSE (H. eurysternus), LONG-NOSED CATTLE LOUSE (Linognathus vituli), and CATTLE BITING LOUSE (Bovicola bovis) were serious cattle pests in ALABAMA. Range beef cattle, especially, lost weight and vitality during the critical late winter months. In ARKANSAS heavier than normal numbers of a WRINKLED SUCKING LOUSE (Solenopotes capillatus) in the northwestern area and of long-nosed cattle louse, 3-6 per square inch, infested cattle in February. Cattle lice were moderate to heavy in most areas of OKLAHOMA through early April. Short-nosed cattle louse and long-nosed cattle louse were most common with an occasional cattle biting louse. Fall activity began in early November. Lice were severe on cattle during winter in MICHIGAN. Short-nosed cattle louse, long-nosed cattle louse, cattle biting louse, and S. capillatus were light on most animals in IOWA during January and February. Practically all cattle herds in MONTANA are usually infested to some degree with lice, especially the short-nosed cattle louse. Cattle lice in UTAH were among the three most troublesome and common pests of livestock. Lice were near normal in NEVADA. Short-nosed cattle louse was unusually heavy on cattle in a few instances in CALIFORNIA.

HOG LOUSE (Haematopinus suis) moderately infested a herd of young hogs in NEW HAMPSHIRE. Numbers in FLORIDA were light on swine in Suwannee County in mid-October. Although present throughout ALABAMA, hog louse was not a serious problem for swine produced under well managed conditions. Infestations in ARKANSAS were spotted and heavier than normal. Light to heavy numbers in OKLAHOMA occurred through late May and in early September. Hog louse was a pest in IOWA.

A SMOOTH SUCKING LOUSE (Linognathus africanus) killed many deer at Lebec, Kern County, CALIFORNIA. Lice were among the most common pests on poultry in UTAH, especially in many farm flocks. CHICKEN BODY LOUSE (Menacanthus stramineus) infestations were varied and heavy in some areas of ARKANSAS. SHEEP BITING LOUSE (Bovicola ovis) was an important pest in TEXAS.

FLEAS in households and other structures were more numerous than usual in NEW HAMPSHIRE. Annoyance from PULICID FLEAS (Ctenocephalides spp.) in RHODE ISLAND peaked about July 29 and continued into September. CAT FLEA (C. felis) was especially troublesome in DELAWARE homes throughout most of 1968. Cat flea and DOG FLEA (C. canis) were annoying in ALABAMA homes all year, and control efforts were continuous and difficult. Cat flea infestations were common in OKLAHOMA homes during summer and numerous in CALIFORNIA residences.

BALD-FACED HORNETS, YELLOW JACKETS, Polistes spp. and other stinging wasps were more numerous in 1967 and 1968 than they were in the previous 2 years in MONTANA. Nestings on and near homes were reported from 27 counties. Polistes spp. were one of most common insects invading homes in OKLAHOMA. Wasp problems in MINNESOTA seemed much more prevalent than usual. Several species of Vespula were very abundant from early August to mid-October throughout PENNSYLVANIA. Stings were numerous. Many yellow jackets entered classrooms in many elementary schools during October.

AMERICAN DOG TICK (Dermacentor variabilis) caused some annoyance by May 10 in RHODE ISLAND, was more prevalent in CONNECTICUT during summer, and annoyed homeowners in Montgomery and Prince Georges Counties in MARYLAND. Activity was common throughout the northern two-thirds of WISCONSIN by May 3. Complaints increased sharply with the opening of the trout season, but numbers were generally much lower than in 1967 although locally high numbers occurred in Ashland, Iowa, Chippewa, and St. Croix Counties. Annoyance was minor after late June. American dog tick was active in MINNESOTA in late April, was most common on dogs in north-central OKLAHOMA during April and May, and was an important pest in TEXAS. American dog tick in UTAH was common but normal in numbers and annoyance in range areas.

PACIFIC COAST TICK (Dermacentor occidentalis) infestations in CALIFORNIA were severe and localized with some tick paralysis involved. The number of incidences of BROWN DOG TICK (Rhipicephalus sanguineus) increased in California. WINTER TICK (D. albipictus) was heavy on several species of animals in western NORTH DAKOTA during March and on livestock in eastern OKLAHOMA during January and early February. Fall activity in the latter State began in mid-November with heavier than normal numbers in many areas in late November and December. LONE STAR TICK (Amblyomma americanum) was reported every month except January in Oklahoma; counts were heaviest from June to September in the east-central area. GULF COAST TICK (A. maculatum) was common on Oklahoma cattle (mostly on the ears) in southern Mayes County in late May and early June. BLACK-LEGGED TICK (Ixodes scapularis) infested deer during spring and fall in Oklahoma.

EAR TICK (Otobius megnini) occurred in localized and heavy outbreaks in CALIFORNIA and caused concern for several UTAH ranchers. RELAPSING-FEVER TICK (Ornithodoros turicata) was an important pest in TEXAS.

NORTHERN FOWL MITE (Ornithonyssus sylviarum) ranged light to moderate in a large laying flock in NEW HAMPSHIRE. This mite heavily infested hundreds of chickens, weakening many and killing some, during January and February at Gainesville, Alachua County, FLORIDA. Northern fowl mite was reported as a new county record in Pike County, ARKANSAS. It was found for the first time on turkeys. Up to 1,000 per bird were found in the northwestern area in late May. Unspecified MITES in UTAH were among the most common pests on poultry, especially in many farm flocks.

TROPICAL RAT MITE (Ornithonyssus bacoti) was an important pest in TEXAS. CHIGGER MITES (Eutrombicula spp.) were annoying in north-central, northeastern, east-central, and southeastern OKLAHOMA from mid-June to early August. An ITCH MITE (Sarcoptes scabiei bovis) was positively identified on only one animal in Big Horn County, MONTANA, but a temporary quarantine was established in the area surrounding the range where the animal had grazed. All animals were treated that could have had contact with the infested animal or with the pastures where it had grazed. MANGE MITES (Chorioptes spp.) infested 1,126 cattle herds (mostly dairy herds) of 6,705 herds examined in VERMONT. Sarcoptes spp. infested 12 of these herds.

BROWN RECLUSE SPIDER (*Loxosceles reclusa*) continued to be reported from homes in many areas of OKLAHOMA. Three bites were reported in 1968. Specimens were identified from several widely separated areas of ALABAMA. Brown recluse spider was reported for the first time from Edgar, Clark, Crawford, Jasper, Effingham, Shelby, Madison, Marion, Union, Gallatin, White, Hamilton, and Christian Counties, ILLINOIS, and from Clark, Vanderburgh, Dubois, and Knox Counties, INDIANA.

HOUSEHOLDS AND STRUCTURES

Highlights:

SUBTERRANEAN TERMITES were major structural pests in Delaware, Oklahoma, and Virginia. Infestations increased in some areas. COCKROACHES were troublesome in dwellings, and EUROPEAN EARWIG was of some concern in the Northeast. CLOVER MITE was annoying in several areas.

EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) caused an increasing number of complaints and infestations in CONNECTICUT. In DELAWARE *R. flavipes* was perhaps the major economic pest, as in past years. Numerous infestations were reported in the spring and early summer. Infestations of *R. flavipes* in MARYLAND were well above normal in 1968. Most infestations were reported from the central and southern counties. Eastern subterranean termite continued as the major structural pest throughout ALABAMA. Swarms in OKLAHOMA began in early March. In CALIFORNIA unspecified TERMITE infestations were about normal. Infestations of WESTERN SUBTERRANEAN TERMITE (*Reticulitermes hesperus*) and another SUBTERRANEAN TERMITE (*R. tibialis*) in NEVADA were more numerous than normal in Clark, Douglas, Humboldt, and Washoe Counties. Western subterranean termite caused problems of varying seriousness in every county of UTAH. In IDAHO *R. hesperus* and *R. tibialis* activity reports were more numerous and more widespread than usual. One panhandle county and 7 southern counties reported activity in homes. *R. tibialis* is native to the Bitterroot Valley and the Clark Fork Valley south of Billings, MONTANA. However, infestations occur in places remote from these areas. Activity increased in 1967 and 1968 with 12 new infestations reported in scattered locations. *Reticulitermes* sp. caused damage to a small building near Edgemont, Fall River County, SOUTH DAKOTA. In IOWA *Reticulitermes* sp. was a structural pest. Swarming in NEW HAMPSHIRE of unspecified TERMITES was first reported March 31. Severe damage to one home was reported at Newmarket, Rockingham County, and infestations were reported from several other locations. In RHODE ISLAND the winged stage of *Reticulitermes* sp. was troublesome from mid-May through July. *Reticulitermes* sp. was the most important structural insect in VIRGINIA in 1968, and reports were widely distributed.

BROWN-BANDED COCKROACH (*Supella supellectilium*), ORIENTAL COCKROACH (*Blatta orientalis*), GERMAN COCKROACH (*Blattella germanica*), and AMERICAN COCKROACH (*Periplaneta americana*) were common in homes in UTAH, and brown-banded cockroach now occurs nearly statewide. These same cockroaches and SMOKY-BROWN COCKROACH (*Periplaneta fuliginosa*) were the predominent species and widespread in ALABAMA. German cockroach was the most important. A WOOD COCKROACH (*Parcoblatta pennsylvanica*), German cockroach, oriental cockroach, and brown-banded cockroach were reported throughout the season in MICHIGAN. The number of unspecified cockroach infestations increased in CONNECTICUT. German cockroach and brown-banded cockroach were the 2 most common species in CALIFORNIA. Several light infestations of German cockroach were reported in MONTANA and were most frequently reported in INDIANA during 1968. German cockroach and oriental cockroach were common in IOWA.

A WEEVIL (*Trachyphloeus bifoveolatus*) continued as one of the more frequent complaints in western WASHINGTON; it was commonly collected in homes west of the Cascade Mountains from Clark County northward to Whatcom County, especially in February and October. In western OREGON adults were very abundant in homes.

FULLER ROSE WEEVIL (*Pantomorus cervinus*) bored holes almost through heater pipes of polyethylene in groves at Winter Haven in Polk County, FLORIDA. Damage was widespread in June. STRAWBERRY ROOT WEEVIL (*Brachyrhinus ovatus*) entered homes in western MONTANA communities. First reports in WISCONSIN of *B. ovatus* were received from one northern and one central county by June 21. Occurrences in homes increased the last week of July and were locally numerous statewide, mainly in the central counties. Strawberry root weevil adults, as in 1967, were reported entering homes in July 1968 in INDIANA. Adults of a JAPANESE WEEVIL (*Calomycterus setarius*) moved into buildings in NEW HAMPSHIRE in late August. Infestations increased in late July in motels and homes in WISCONSIN and continued into September.

ELM LEAF BEETLE (*Pyrrhalta luteola*) entered homes in UTAH and was quite a problem in a number of communities and much of Salt Lake County. In OKLAHOMA and IOWA elm leaf beetle was a common pest in homes. FURNITURE CARPET BEETLE (*Anthrenus flavipes*) and other carpet beetles were abundant throughout MICHIGAN, and *A. flavipes* was a common pest in IOWA. BLACK CARPET BEETLE (*Attagenus piceus*) is well distributed throughout CONNECTICUT and commonly occurs in IOWA. DRUGSTORE BEETLE (*Stegobium paniceum*) had about the usual number of infestations, and BROWN SPIDER BEETLE (*Ptinus clavipes*) was heavy locally in CALIFORNIA. Heavy adult migrations of a LONG-HORNED BEETLE (*Oncideres rhodosticta*) occurred September 11-23 at Willcox, Cochise County, ARIZONA. SOUTHERN LYCTUS BEETLE (*Lyctus planicollis*) caused very heavy damage to one home each in Ormsby and Washoe Counties, NEVADA. In CONNECTICUT adult *Lyctus* sp. emerged from oak flooring in year-old houses, and undetermined species from timbers and furniture. A CERAMBYCID BEETLE (*Callidium* sp.) emerged from native oak paneling in a Guilford home.

CLOVER MITE (*Bryobia praetiosa*) showed a decline in 1968 from 1967 in NEW HAMPSHIRE. Clover mite entered homes in RHODE ISLAND and became a problem in new housing in urban areas of CONNECTICUT. In DELAWARE, VIRGINIA, and TENNESSEE clover mite was troublesome in homes during the spring. In MICHIGAN clover mite was heavy in April and May, and common in IOWA. Clover mite entered homes during the spring at Cody, Thermopolis, and Laramie, WYOMING, while in UTAH it was common in offices and schoolrooms. Clover mite was less of a problem than in previous years in CALIFORNIA. An EPIDERMOPTID MITE (*Dermatophagoides pteronyssina*) was heavy on a rug and upholstered furniture, apparently causing a skin reaction to an infant, at Meriden, New Haven County, CONNECTICUT. This is a new State record.

EUROPEAN EARWIG (*Forficula auricularia*) reports increased rapidly in late June in NEW HAMPSHIRE. European earwig has become more numerous and of greater annoyance inside and outside of homes in VERMONT. In RHODE ISLAND European earwig complaints were numerous about June 6 and increased by August 2. While widespread in CONNECTICUT, this earwig was a greater nuisance in homes. European earwig caused no damage although numbers increased in PENNSYLVANIA; it was a nuisance in many locations throughout the State. In CALIFORNIA European earwig was more widespread but entered fewer homes.

BLACK CARPENTER ANT (*Camponotus pennsylvanicus*) workers were a common problem in NEW HAMPSHIRE, and some structural damage was noted. Most of the infestations of *C. pennsylvanicus* involved small numbers; however, nearly all infestations were located on second and third floor rooms. In IOWA black carpenter ant was a structural pest. *Camponotus* sp. in RHODE ISLAND was troublesome in the wing stage from May 10 into August and was one of most common pests invading homes in OKLAHOMA. *Camponotus* sp. caused much concern to many homeowners at locations in Gallatin, Stillwater, Richland, Yellowstone, Ravalli, and Flathead Counties, MONTANA.

BOXELDER BUG (*Leptocoris trivittatus*) was normal and common in homes, offices, and schoolrooms in UTAH, while infestations were twice as numerous in MONTANA compared with 1967. A COREID BUG (*L. rubrolineatus*) caused much concern at many locations in CALIFORNIA. Unusual infestations of a LYGAEID BUG (*Nysius raphanus*) occurred early in the year and late in summer in CALIFORNIA. In ARIZONA, migrations of *Nysius* spp. were heavy in the Salt River Valley of Maricopa County during late May and lighter at Benson in Cochise County, Stafford in Graham County, and Tucson in Pima County during late May and early June.

Unspecified MILLIPEDS were especially migratory and annoyed homeowners in MICHIGAN. In PENNSYLVANIA millipeds were by far the most common household pests in 1968. Problems occurred statewide, were locally heavy in all sections, and peaked from late August to late October. Millipeds entered homes in large numbers in the Winchester area of Frederick County, VIRGINIA. Enormous numbers of a CRICKET (*Nemobius fasciatus*) occurred in downtown areas in north-central Virginia during August; this was the heaviest occurrence since 1947. In the State of CALIFORNIA there were many complaints due to *Gryllus* spp.

STORED PRODUCTS

Highlights:

GRANARY WEEVIL infested stored grain in Montana for the first time since 1965. RICE WEEVIL was serious in stored corn and grain sorghum in Alabama. SAW-TOOTHED GRAIN BEETLE was more numerous in Montana than usual. FLAT GRAIN BEETLE was a problem in several seed warehouses in Florida. INDIAN-MEAL MOTH was serious in feed storage buildings in New Mexico and was common in northern Missouri.

GRANARY WEEVIL (*Sitophilus granarius*) infested stored grain at Huntley, Yellowstone County, MONTANA. This was the first known infestation of this weevil in the State since 1965. RICE WEEVIL (*S. oryzae*) was one of the most common pests of stored products in UTAH and was one of 3 common pests of stored grain and household cereal products in MISSOURI. Rice weevil was a serious pest of stored corn and grain sorghum in central and southern ALABAMA. Immatures and adults of rice weevil were heavy in 2,000 bushels of shelled corn in a metal bin at Live Oak, Suwannee County, FLORIDA, during May.

Several DERMESTID BEETLES, *Trogoderma simplex*, *T. parabile*, and *T. ornatum*, were common and occasionally heavy in seed and warehouses in CALIFORNIA. LARDER BEETLE (*Dermestes lardarius*) was one of the most common stored product pests in UTAH. In SOUTH DAKOTA, larvae and adults of larder beetle were unusually heavy in 800 bushels of stored sorghum on a farm near Carpenter, Beadle County. Controls were applied. *T. parabile* larvae collected from stored barley at Fargo, Cass County, on August 1, 1967, were reported for a new State record in NORTH DAKOTA. Larder beetle was a common pest in IOWA, abundant throughout the season in MICHIGAN, of considerable annoyance in many VERMONT households, and heavier in NEW HAMPSHIRE in 1968 than during the past 3 years.

SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*) was one of the most common pests in UTAH. Ordinarily reported only a few times each year in MONTANA, it was noted in many places in 1968. This pest was one of the most common insects entering homes in OKLAHOMA, one of the 3 common pests of stored grain and household cereal products in MISSOURI, and a common pest in IOWA. Many reports were received throughout VIRGINIA. Many complaints occurred throughout CONNECTICUT where more than the usual number of packaged goods were found infested when first opened. Several infestations of saw-toothed grain beetle in homes were reported during spring in NEW HAMPSHIRE.

RUSTY GRAIN BEETLE (*Cryptolestes ferrugineus*) was one of 2 major pests of stored products in OREGON, and it heavily infested stored barley and wheat dairy feed in Clark County, NEVADA. FOREIGN GRAIN BEETLE (*Ahasverus advena*) was common in IOWA and unusually numerous in homes in late summer in INDIANA. Adults of FLAT GRAIN BEETLE (*Cryptolestes pusillus*) infested large quantities of Argentine Bahia grass seed (*Paspalum notatum* var. *saurae*) in seed warehouses at Orlando, Bartow, and Dade City, FLORIDA, during November. Controls were applied to this seed as well as a railroad boxcar of seed.

RED FLOUR BEETLE (*Tribolium castaneum*) was heavy in stored barley and wheat dairy feed in Clark County, NEVADA. CONFUSED FLOUR BEETLE (*T. confusum*) was heavy in an unused overhead conveyer system in Maricopa County, ARIZONA. Larvae dropped into newly processed milo planting seed below. The premises were fumigated in late January. In UTAH red flour beetle and confused flour beetle were common in stored products. YELLOW MEALWORM (*Tenebrio molitor*) infested grain at Glasgow, Valley County, and cereal at Helena, Lewis and Clark County, MONTANA. Red flour beetle and confused flour beetle were common pests in IOWA. The latter species was one of 3 common pests of stored grain and household cereal products in MISSOURI.

CIGARETTE BEETLE (*Lasioderma serricorne*) was the predominant pest of foods in kitchen pantries throughout ALABAMA in 1968, was one of the major species damaging stored goods in TEXAS, and was common in homes throughout VIRGINIA. In DELAWARE an unusually large number of cigarette beetle infestations occurred in homes, mostly in dried cereal products.

A HAIRY FUNGUS BEETLE (*Typhaea stercorea*) was one of 2 major insects in OREGON. DRUGSTORE BEETLE (*Stegobium paniceum*) increased greatly in pantry supplies in CALIFORNIA. LESSER GRAIN BORER (*Rhyzopertha dominica*) heavily infested stored barley and wheat dairy feed in Clark County, NEVADA, for the second record in this county. Lesser grain borer in ARIZONA was very heavy in stored grain sorghum in late January at Yuma, Yuma County, and was one of the major stored products pest in TEXAS. Controls were required for COWPEA WEEVIL (*Callosobruchus maculatus*) in a commercial grain and seed company in September at Orlando, Orange County, FLORIDA.

INDIAN-MEAL MOTH (*Plodia interpunctella*) was one of 2 more frequently reported pests of stored products in CALIFORNIA. This pest in UTAH was one of the most common in stored products. Indian-meal moth appeared to be a serious problem in several feed storage buildings during surveys for khapra beetle (*Trogoderma granarium*) throughout NEW MEXICO. Indian-meal moth larvae damaged stored milo in September in NEBRASKA, but infestations were generally not so common as in 1967. Larvae of this phycitid moth were the most common stored product pests in IOWA. Infestations in the northern half of MISSOURI were common in stored corn, wheat, and some soybeans in late summer and fall. Immatures and adults of Indian-meal moth heavily infested 2,000 bushels of shelled corn in a metal bin at Live Oak in Suwannee County, FLORIDA, during May. Indian-meal moth was the most prevalent pest of stored products in CONNECTICUT.

MEDITERRANEAN FLOUR MOTH (*Anagasta kuehniella*) was one of 2 more frequently reported stored-product pests in CALIFORNIA, and ALMOND MOTH (*Cadra cautella*) was frequently reported. Both species were major pests of stored products in TEXAS. ANGOUMOIS GRAIN MOTH (*Sitotroga cerealella*) infested shelled and ear corn throughout MISSOURI during spring and summer. A large amount of corn harvested last fall (1967) was apparently infested in the field. In ALABAMA almond moth was the more important of the stored peanut pests, and Angoumois grain moth was a serious storage pest for feed manufacturers and of stored peanuts, corn, and grain sorghum.

BENEFICIAL INSECTS

Highlights:

LADY BEETLES were effective in controlling economic populations of pea aphid on alfalfa in Nevada and Kansas and on peas and alfalfa in Wisconsin. These insects and GREEN LACEWINGS were also effective during the outbreak of greenbug on sorghum in Kansas. Green lacewings were effective in controlling pea aphid on alfalfa in Kansas and aphids on other crops in several areas.

CONVERGENT LADY BEETLE (*Hippodamia convergens*) adults were observed clustered for overwintering on the north fork of Ahtanum Creek, at about 2,800 feet elevation in Yakima County, WASHINGTON, on October 31. A LADY BEETLE (*Scymnus intrusoides*) was collected September 9 in Grant County, Washington, for a new State record. Another LADY BEETLE (*Anatis rathvoni*) was unusually abundant in Curry, Union, and Wallowa Counties, OREGON. Lady beetles, mostly convergent lady beetle, helped to reduce economic numbers of *Acyrthosiphon pisum* (pea aphid) and kept other pea aphid populations noneconomic in NEVADA. Lady beetles held most cotton pests at low levels in the State. Convergent lady beetle adults and larvae ranged moderate to heavy on alfalfa, barley, corn, cotton, safflower, sugarbeets, and sweetpotatoes in ARIZONA from April through July. VEDALIA (*Rodolia cardinalis*) adults were released in a large citrus grove on the west side of the Salt River Valley in Maricopa County, Arizona, in early June. By early September this coccinellid had controlled the heavy infestation of *Icerya purchasi* (cottony-cushion scale) in this grove. Unspecified lady beetles were some of the most beneficial species in UTAH, and adults and larvae were numerous in WYOMING on alfalfa, corn, sugarbeets, and potatoes. Various species kept aphid populations low on corn and sorghum in southeastern Wyoming. Lady beetles were heavy on alfalfa, sainfoin, grain, ornamentals, and in shelterbelts in MONTANA.

Lady beetles and other beneficial insects helped to control the outbreaks of pea aphid on alfalfa and of *Schizaphis graminum* (greenbug) on sorghum in KANSAS. Losses would have been much higher otherwise. Lady beetle adults and/or larvae in IOWA ranged moderate to high through the growing season. In WISCONSIN adults and larvae, mostly convergent lady beetle, were heavy enough by August to control *Rhopalosiphum maidis* (corn leaf aphid) with the aid of syrphid fly larvae, *Orius insidiosus* (a flower bug), and weather. Lady beetles helped to stabilize pea aphid numbers on peas and alfalfa in the State. In OKLAHOMA convergent lady beetle, active from mid-January to mid-December, was especially high during the greenbug outbreak on sorghum in late July and August. Convergent lady beetle was an important predator in ARKANSAS from April through June. Aestivation occurred earlier than usual in late May. *Coleomegilla maculata* was also an important predator beginning in April but continuing through the year. In ALABAMA convergent lady beetle and *C. maculata fuscilabris* were the more important of the numerous lady beetles on cotton, grain, vegetables, and in other situations. They controlled aphids mostly. Convergent lady beetle was frequently encountered and *C. maculata* was common throughout the growing season in VIRGINIA.

MELYRID BEETLES (*Collops* spp.) were some of the most common beneficial insects in UTAH. *Collops* spp. kept most cotton pests low in NEVADA and were heavy in ARIZONA on alfalfa in May in Graham County and on alfalfa, cotton, and sorghum from mid-June through mid-July in Cochise, Maricopa, and Pinal Counties. Approximately 200 adults of a FLEA BEETLE (*Altica carduorum*) were released on Canada thistle in southwestern WISCONSIN. A LEAF BEETLE (*Agasicles* sp.) in FLORIDA has now spread by artificial and natural means to all areas where alligatorweed is located. Control is satisfactory, but results vary. Evaluation continues.

BRACONIDS (*Aphidius pulcher* and *A. smithi*) in WASHINGTON heavily parasitized pea aphid in April east of Umapine, Walla Walla County. Counts averaged 12-20 per 100 sweeps with a maximum of 100+ per 100 sweeps on alfalfa. *Aphidius* spp. helped to reduce economic numbers of pea aphid and kept other pea aphid populations noneconomic in NEVADA. *Lysiphlebus testaceipes* in OKLAHOMA parasitized greenbug from late March to late April. Numbers were highest in late April. *Lysiphlebus* sp., other braconids, and other beneficial insects in KANSAS eventually played a major role in controlling the outbreaks of pea aphid on alfalfa and of greenbug on sorghum. Losses would have been much higher otherwise. Braconids, especially *L. testaceipes*, were the most important parasites of aphids on cole crops, cotton, and grain in ALABAMA. *Microctonus aethiops* was released and recovered in NEW HAMPSHIRE.

ICHNEUMON WASPS were some of the most common beneficial insects in UTAH. Dicaelotus sp. and Centeterus sp. were reared from pupae of Walshia miscecolorella (a walshiid moth) collected in 1968 at Lincoln, Lancaster County, NEBRASKA. Bathyplectes curculionis was reported as a new State record in ARKANSAS. Adults of B. curculionis were recovered and adults of B. anura were collected in Montgomery County, VIRGINIA. B. curculionis and B. contracta were released in NEW HAMPSHIRE. B. curculionis was recovered in this State and from earlier release sites in VERMONT.

Hymenopterous parasites effectively held most cotton pests at low levels in NEVADA and controlled up to 50 percent of the aphids in ARKANSAS, especially on cereal and forage crops. Parasites were active on the warmest days of winter in Arkansas. A MINUTE EGG PARASITE (Trichogramma minutum) was one of the most important parasites of bollworm and tobacco budworm eggs in cotton in ALABAMA. A EULOPHID WASP (Tetrastichus incertus) was recovered from earlier release sites in VERMONT and was also recovered in NEW HAMPSHIRE.

HONEY BEE (Apis mellifera) in ARIZONA was in better condition in mid-March than at this period in 1967. Honey production declined markedly throughout UTAH because of frost-damaged alfalfa blossoms and other flowers. Nearly 3 percent of the 11,000 colonies inspected in MONTANA were infected with American foulbrood. The 1968 honey season in KANSAS was near average although dry conditions in the western area substantially cut some averages. Of 2,240 hives inspected, 125 hives were treated for or destroyed because of American foulbrood and 544 hives in the northern area were found with nosema disease. As of July 1, 1968, honey bee colonies in ALABAMA were recorded at 91,000, a 5 percent decline from 1967. The 174,000 colonies of 1956 have been declining steadily. Colony condition in OHIO on July 1 was better than in 1967 but still below average. Most colonies wintered well. Heavy rains in May and excessive swarming lowered earlier favorable prospects of honey production. In MICHIGAN the number of honey bees has increased by nearly 20,000 colonies in the last 4 years. Research on the pollination requirements of blueberries and cucumbers greatly increased rental of bees for these crops. Honey bee swarmed throughout RHODE ISLAND on May 20.

LEAFCUTTING BEES (Megachile spp.) were unusually abundant around ornamentals in CALIFORNIA. In central and northern NEVADA more reliance was placed on Megachile rotundata and less on honey bee for pollination of alfalfa. M. rotundata emerged in IDAHO on June 1 in the Arena Valley near Parma, on June 26 at Jerome (14 days earlier than in 1967), and on July 1 in Moscow.

ALKALI BEE (Nomia melanderi) adults in OREGON were first seen flying the first week of June in Umatilla County; very few females were seen. Males were emerging from their burrows in mid-June in Malheur County. Freshly emerged Zodion obliquefasciatum (a conopid fly) and Heterostylum robustum (a bee fly) were also noted. N. nevadensis arizonensis was abundant around safflower at Yuma, Yuma County, ARIZONA.

LACEWINGS kept most cotton pests low in NEVADA. Adults in ARIZONA were found all year on alfalfa in the Salt River Valley, Maricopa County. GREEN LACEWINGS (Chrysopa spp.) were among the most common beneficial insects in UTAH. Chrysopa spp. numbers in WYOMING were small and scattered in 1968. All stages of Chrysopa spp. occurred statewide in MONTANA on crops, ornamentals, and weeds. Green lacewings and other beneficial insects eventually played a major role in controlling outbreaks of pea aphid on alfalfa and of greenbug on sorghum in KANSAS. Losses would have been much higher otherwise. Lacewings were common but not high throughout the growing season in IOWA. In ARKANSAS 10-15 Chrysopa spp. adults in 100 sweeps were present by April 12 on alfalfa; larvae were found on April 19. In ALABAMA larvae of GOLDEN-EYE LACEWING (C. oculata) were one of the more important aphid predators on corn, grain sorghum, cotton, ornamental shade trees, and vegetables.

DAMSEL BUGS kept most cotton pests low in NEVADA. *Nabis ferus* in ARIZONA was numerous from mid-June through mid-October on alfalfa in Cochise, Graham, and Pinal Counties; adults were active all year in Maricopa and Yuma Counties. *Nabis alternatus*, *N. ferus*, and other species were some of the most common beneficial insects in UTAH. Adults and nymphs of *Nabis* spp. in WYOMING were moderate on alfalfa throughout the season. Several species were collected on alfalfa throughout south-central MONTANA. *Nabis* spp. were common on cotton and alfalfa during summer in OKLAHOMA and were general predators throughout 1968 in ARKANSAS, where counts reached 150-200 in 100 sweeps of alfalfa in late May. *Nabis* spp. ranged moderate to high in IOWA throughout the growing season.

ANTHOCORID BUGS in WASHINGTON were heavier than usual in infestations of *Tetranychus mcdanieli* (a spider mite) on apples at Yakima, Yakima County, in August. BIG-EYED BUGS (*Geocoris* spp.) and MINUTE PIRATE BUGS kept most cotton pests low in NEVADA. *Geocoris* spp. were heavy on alfalfa in ARIZONA from April through October and on cotton in June in Salt River Valley, Maricopa County; FLOWER BUGS (*Orius* spp.) were heavy on alfalfa in May and June in Cochise and Maricopa Counties. *Geocoris* spp., *Orius tristicolor*, and *O. insidiosus* were some of the most common beneficial insects in UTAH. Fairly numerous on corn early in the season, *O. insidiosus* helped to supress corn leaf aphid in WISCONSIN. In ARKANSAS, *O. insidiosus* was the major predator on corn and sorghum, and *Geocoris* spp. were the major predators on sunflowers; both were lower than normal on cotton. *G. punctipes* and *Orius* spp. were perhaps the more important Hemiptera in ALABAMA attacking eggs and larvae of bollworms and tobacco budworms on cotton, corn, tomatoes, soybeans, and beans. A STINK BUG (*Euthyrhynchus floridanus*) in FLORIDA preyed on adults of *Diaprepes abbreviatus* (West Indian sugarcane root borer) in the Apopka area of Orange County during October, but their effect is unknown.

SYRPHID FLIES effectively held most cotton pests at low levels in NEVADA. Larvae of an unspecified syrphid fly were moderate and fed on aphids infesting barley in early March and were active in citrus groves in mid-April in the Salt River Valley in Maricopa County, ARIZONA. Larvae of SARCOPHAGID FLIES on grasshoppers and of syrphid flies were some of the most common beneficial insects in UTAH. Syrphid flies were extremely active throughout MONTANA around shrubs, flowers, and weeds. Larvae of syrphid flies in ALABAMA were among the more important predators of aphids on corn, grain sorghum, cotton, ornamental shade trees, and vegetables.

PHYTOSEIID MITES, particularly *Typhlodromus* spp. and *Zetzellia* spp., showed promise in partially controlling phytophagous mites in OREGON, but definite difficulties arose in using integrated mite control in Hood River County. *Typhlodromus* sp. controlled *Tetranychus mcdanieli* in several Wasco County cherry orchards in August but was not so effective in Jackson County.

WEATHER OF THE YEAR 1968[1]

Weather conditions in the United States during 1968 were mostly favorable, and suffering, deaths, and damage from unfavorable weather were generally near normal. The crop season set a new high in total production, as higher crop yields tended to offset lower acreages, surpassing last year's record yields per acre in most instances.

COLD SPELLS: The first half of January was extremely cold in the eastern half of the conterminous United States. Temperatures fell to 50°F below zero in the eastern North Dakota and northwestern Minnesota area and to 40°F below in sections of northern New England with below zero readings as far south as northern Texas, Arkansas, and Tennessee, and readings in the 20's along the middle gulf. Temperatures did not rise above 0°F during the first 10 days of January in much of the extreme northern Great Plains. Nantucket Harbour (Massachusetts) froze over; this previously occurred during the coldest winter of record in the Northeast in 1917 and 1918. Ice conditions in the Chesapeake Bay were the worst since 1963.

A freeze on April 13 caused damage of several millions of dollars to fruit in western Oregon. Another late spring freeze caused $1 million damage to fruit in Ohio on May 6. Severe freezes occurred deep in the Florida Peninsula on December 15-17, with frosts in the suburbs of Miami. The damage, however, appears to have been mostly light to citrus and moderate to vegetables, but severe to some tender vegetables.

HOT SPELLS: Heat waves were less frequent and severe than usual. The most significant was hot, humid weather over the Southeast the last week of July and in most of the Middle Atlantic States the first 25 days of August.

SNOWSTORMS: From January 6 to 8 snowfall of 3 to 20 inches over New England was blown by 60 m.p.h. winds into drifts that reached 20 feet in some instances, paralyzing transportation and closing schools in many areas. Many buildings in Massachusetts collapsed under the weight of snow and ice.

Heavy snow and windblown drifts between January 13 and 16 from the Mississippi River to the Appalachians delayed transportation, closed schools, and resulted in over a dozen deaths from overexertion, mostly in the area from the Virginias to southern Michigan.

Snowstorms that reached blizzard proportions overspread the northern and central Great Plains, upper Mississippi Valley, and upper Lakes region on December 18-19 and 21-22. Snowfall, reaching depths of 1 to 2 feet in some areas, was blown in drifts of 5 to locally 20 feet high by strong winds that exceeded 60 m.p.h. in some areas. Traffic was brought virtually to a standstill in many areas.

HAILSTORMS: These storms were frequent, particularly in the midcontinent, and total damage appeared to be near normal.

On April 27 hail damage in Marshall and Harrison Counties, Texas, was estimated at $1,350,000.

Hail up to 4 inches in diameter in Iowa City, Iowa, on May 15 caused property damage of more than $3,500,000.

The worst hailstorm in 55 years occurred at Oklahoma City and surrounding county areas on May 23-24; losses from hail, rain, and lightning were placed at $20 million.

1/ Prepared by L.H. Seamon, Climatologist, Environmental Data Service, Environmental Science Service Administration, Washington, D.C.

Hailstorms caused $1,200,000 damage in Big Spring, Texas, on May 5 and crop losses of $1 million in the vicinity of Littlefield, Texas, on June 9.

Hail losses of $2.5 million occurred in Lapeer and St. Clair Counties, Michigan, on July 5.

TORNADOES: Tornadoes were fewer during 1968 than in 1967, but the total number and loss of life and property were near normal.

On May 15, 37 tornadoes were scattered through 9 States. The most destructive tornado of the year occurred on this date in Iowa when 13 persons were killed, 450 injured, and property losses were estimated up to $30 million at Charles City. This storm damaged or destroyed many farmsteads and rural homes along its path, and also injured 12 persons and caused $1.5 million property damage in Elma. Another tornado, also on May 15, passed through Oelwein and Maynard, Iowa, killing 5 persons, injuring 156, and destroying property estimated at $21 million, most of which occurred in Oelwein.

The worst of 6 tornadoes in Arkansas on May 15 passed through Tuckerman, Jonesboro, Fairview, and Nettleton. A high school at the latter location was almost completely destroyed. The storm killed 34 persons, injured 350, and destroyed 164 homes. Damage was in the millions of dollars. Another tornado killed 7, injured 24, and caused $500,000 damage at Oil City, Arkansas, on this date.

Some other tornadoes, less destructive than those already listed included the following. On April 3, one death, six injuries, and property damage in excess of $1 million occurred at Paragould, Arkansas. On April 19 a tornado killed 14 persons, injured 270, and damaged or destroyed over 400 homes and 69 business units in Greenwood, Arkansas. A Kentucky tornado on April 23 passed through Pendleton, Bracken, and Mason Counties killing 5 persons, injuring 360, and destroying 200 houses, 3 churches, and 175 barns.

TROPICAL STORMS (HURRICANES): Tropical storm Candy moved inland near Port Aransas, Texas, on June 23 with near hurricane force winds, tides 3 to 4 feet above normal along the coast, and heavy rains from Texas to northern Illinois. Texas was hardest hit with over $2 million crop damage and $625,000 property damage.

Hurricane Gladys moved northeastward across the northern portion of the Florida Peninsula on October 18 and 19. Damage, mainly in the Tampa Bay and Ocala area, was estimated at $6,700,000. Five- to 8-foot storm tides washed out roads and destroyed buildings along the miles of beaches from Venice to Cedar Keys, Florida. However, Gladys' rains greatly benefited North Carolina by relieving droughty conditions.

DROUGHTS: Prolonged serious droughts were lacking in 1968. However, a few areas were affected by moderate to locally extreme drought. In western sections of the central Great Plains precipitation was less than half of normal during the winter and early spring, resulting in reduced yields of small grains in that area. Drought was extreme in southern Alabama from late June to August and moderate to severe in adjacent southern portions of Mississippi and Georgia.

FLOODS: Flash flooding in central Texas resulted from heavy rains on January 18 and 19. Damage was estimated at about $3 million in the San Antonio area, and 5 deaths were reported. On January 5 a flash flood in the Pearl Harbor area on the Hawaiian island of Oahu caused damage estimated at $2.5 million.

Heavy rains up to 7 inches on March 17 to 19 with snowmelt and breaking up of river ice in southern New England caused disastrous floods in southern New England. Thousands were evacuated from their homes, many thousands of homes were seriously damaged, and 32,000 phones were out. Damage was estimated at well over $100 million.

On April 8 to 10, heavy rains in west-central and northern Louisiana totaling up to 12.62 inches caused flooding of 80,000 acres and washed out roads and bridges. Damage near Natchitoches, Louisiana, was estimated near $1 million.

Disastrous floods occurred in New Jersey when up to 7 inches or more of rain fell on May 28 to 30. Over 2,000 families were evacuated in the State's worst flood since 1936, and 7 persons drowned. Damage was estimated at $133 million.

Heavy rains during May from Texas and Oklahoma to Ohio and Pennsylvania caused flooding of many rivers. Flooding in the Wabash and Ohio River Basins continued into June, and damage for the two months was estimated at $12 million for the Wabash and $40 million for the Ohio.

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Included in the "Summary of Insect Conditions in the United States - 1968" are the following special reports:

1. The highlights section of Forest Insect Conditions in the United States - 1968, compiled by the Forest Service, U.S. Department of Agriculture.
2. Screw-worm (*Cochliomyia hominivorax*) Summary compiled by Animal Health Division, U.S. Department of Agriculture.
3. The highlights section of the weekly weather summary for the United States - 1968, compiled by the Environmental Data Service, U.S. Department of Commerce.

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